Supreme Court, U.S.
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No. 04-108

In The Supreme Court of the United States

SUSETTE KELO, THELMA BRELESKY, PASQUALE CRISTOFARO, WILHELMINA AND CHARLES DERY, JAMES AND LAURA GURETSKY, PATAYA CONSTRUCTION LIMITED PARTNERSHIP, and WILLIAM VON WINKLE,

Petitioners,

v.

CITY OF NEW LONDON, and NEW LONDON DEVELOPMENT CORPORATION,

Respondents.

On Writ Of Certiorari To The Supreme Court Of Connecticut

JOINT APPENDIX
Volume II, Pages 213 to 487

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DEFENDANTS' EXHIBIT 34

DRAFT ENVIRONMENTAL IMPACT EVALUATION

FORT TRUMBULL
MDP AREA
New London, Connecticut

November 10, 1998

(Map Omitted In Printing)

Sponsoring Agency:
State of Connecticut
Department of Economic and Community Development

Implementing Agency:
New London Development Corporation
New London, Connecticut

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HRP Associates, Inc. – Hazardous Waste and Contamination Assessment
Diversified Technology Consultants, Inc. – Civil Engineering
Wilbur Smith Associates – Traffic Engineering

(LOGO) MILONE & MACBROOM

NOTE TO REVIEWERS
November 10, 1998

Notice is hereby given by the State of Connecticut Department of Economic and Community Development that, pursuant to Section 22a-1(d) of the Connecticut Environmental Policy Act, a Copy of the Draft Environmental Impact Evaluation (DEIE) document for the Fort Trumbull Municipal Development Plan (MDP) Area, New London, Connecticut is available for review at the office of the New London Development Corporation, 165 State Street, Suite 313, New London, Connecticut. Copies of the DEIE are also available at the following locations:

New London City Clerk's Office
New London Public Library
New London Office of Development & Planning
New London Senior Center
Connecticut Department of Economic
and Community Development

This project will involve preparation and implementation of a Municipal Development Plan under Section 130, 132, and/or 588(1) of the Connecticut General Statutes. The project area is located along the west bank of the Thames River to the north of Greens Harbor and includes the U.S. Navy's closed Naval Undersea Warfare Center (NUWC), the regional Water Pollution Control Facility, and the adjacent Fort Trumbull area to the east of the Amtrak rail line, and portions of Howard Street, Hamilton Street, Shaw Street, and Harris Street to the west of the rail line.

The comment period for the DEIE will conclude on December 28, 1998. Written comments should be submitted to:

Attention: Peter Simmons, P.E.
Community Development Specialist
Connecticut Department of Economic
and Community Development
505 Hudson Street
Hartford, Connecticut 06106

The Draft EIE has been distributed to the following agencies and organizations:

Federal Organizations/Individuals	Number of Copies
U.S. Navy	2
U.S. Coast Guard Academy	1
U.S. Army Corps of Engineers	1

State Organizations/Individuals	Number of Copies
Department of Economic and Community Development	5
Department of Environmental Protection	7
Department of Transportation	5
Connecticut Historical Commission	1
Council of Environmental Quality	1
Office of Policy and Management	2

Local Organizations/Individuals	Number of Copies
New London City Clerk	1
New London Public Library	1
New London Senior Center	1
New London City Councilors	7
New London City Manager	1
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New London Fire Chief	1
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Hirschl & Silvestri	1
NLDC Corporate Council	1
EDAW Architects	1
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LIST OF ABBREVIATIONS

ACOE	Army Corps of Engineers
B&C	Bartram and Cochran MBIA
BRAC	Base Realignment and Closure
CCMA	Connecticut Coastal Management Act
CDM	Camp Dresser & McKee, Inc.
CEPA	Connecticut Environmental Policy Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CGS	Connecticut General Statutes
CHC	Connecticut Historical Commission
CHFA	Connecticut Housing Finance Authority
CL&P	Connecticut Light & Power
CO	Carbon Monoxide
COG	Council of Governments
CTDEP	Connecticut Department of Environmental Protection
dBA	A-Weighted Decibel
DECD	Department of Economic and Community Development
DEP	Department of Environmental Protection
DOT	Department of Transportation
DPH	Department of Public Health
DPUC	Department of Public Utility Control
DSS	Decent, Safe, and Sanitary
DTC	Diversified Technology Consultants
EA	Environmental Assessment
EIE	Environmental Impact Evaluation
EPA	Environmental Protection Agency
ERA	Economics Research Associates
FEMA	Federal Emergency Management Agency

FHWA	Federal Highway Administration
gpd	gallons per day
HMA	Harrall-Michalewski Associates, Inc.
HUD	Department of Housing and Urban Development
ISO	Insurance Services Organization
kV	kilovolt
KVA	kilovolt ampere
L_{dn}	Day/Night Sound Level
L_{eq}	Equivalent Sound Level
LOS	Level of Service
LRA	Local Reuse Authority
MDP	Municipal Development Plan
$\mu g/m^3$	microgram per cubic meter
MG	million gallons
MGD	million gallons per day
MMI	Milone & MacBroom, Inc.
NAAQS	National Ambient Air Quality Standards
NDDB	Natural Diversity Data Base
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGVD	National Geodetic Vertical Datum
NLDC	New London Development Corporation
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NUWC	Naval Undersea Warfare Center
OLISP	Office of Long Island Sound Programs
OPM	Office of Policy and Management
Pb	Lead
PM	Particulate Matter

PO	Project Oceanology
ppb	parts per billion
ppm	parts per million
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
RKG	RKG Associates, Inc.
RSR	Remediation Standard Regulations
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization
SCS	Soil Conservation Service
SEAT	South East Area Transit
SF	Square Feet
SHPO	State Historic Preservation Officer
SNET	Southern New England Telephone
SO_2	Sulfur Dioxide
STC	State Traffic Commission
TAMS	TAMS Consultants, Inc.
TCLP	Toxicity Characteristic Leaching Procedure
ULI	Urban Land Institute
URAA	Uniform Relocation Assistance Act
U.S.	United States
USDA	United States Department of Agriculture
USHUD	United States Department of Housing and Urban Development
UST	Underground Storage Tank
WPCF	Water Pollution Control Facility
WRT	Wallace Roberts and Todd
WSA	Wilbur Smith and Associates
WWPCA	Water and Water Pollution Control Authority
XRF	x-ray fluorescent

EXECUTIVE SUMMARY

Introduction

Project Background

The New London Development Corporation (NLDC), in association with the Connecticut Department of Economic and Community Development (DECD), is undertaking a planning project adjacent to the Thames River in New London, Connecticut. Plans for the project area are being prepared in accordance with a Municipal Development Planning process under Section 130, 132, and/or 588(1) of the Connecticut General Statutes. The planning process may result in a recommendation to undertake redevelopment of all or part of the planning area. Because state funds are involved, this Environmental Impact Evaluation (EIE) is being prepared under the Connecticut Environmental Policy Act (CEPA) in conjunction with the Municipal Development Plan (MDP).

The population in New London has been declining since 1960 and has not been lower since the 1930's. The unemployment rate in New London as of June 1998 was 7.6%, as compared to the nearby urban municipalities of Norwich at 6.3% and Groton at 4.7%, and statewide unemployment of 4.0%. The end of the "cold war" and reduction in defense contracts has had a significant local economic impact.

The project area is located in the southeast part of New London, encompassing approximately 90 acres of primarily residential and commercial areas. The project area includes the U.S. Navy's closed Naval Undersea Warfare Center (NUWC) along the Thames River, the regional Water Pollution Control Facility (WPCF), and the adjacent Fort Trumbull area, including all or portions of Howard,

Hamilton, Shaw, Harris, Trumbull, Walbach, Nameaug, Smith, Chelsea, Goshen, and East Streets, and Pequot Avenue. For discussion purposes, the project area, which is generally referred to as the Fort Trumbull area, has been segmented into several smaller areas as shown on Figure 1.1-4 and on the front cover of this document. These are referenced as the Gateway Area, Fort Area, NUWC, and Lower Pequot Avenue Area.

The Fort Trumbull area has been targeted for evaluation under the municipal development planning process for numerous reasons. The majority of structures in the area are in relatively poor condition, exhibit a high amount of functional obsolescence, and have limited market potential. Vacancy rates are notably high (82% vacancy of non-residential buildings and 20% vacancy of residential units). Tax revenues in the MDP area (±$325,000) are quite low considering it comprises an area of approximately 90 acres.

An 800,000 square foot clinical research development facility proposed by Pfizer, Inc. (to be located immediately to the south and outside of the MDP area) and reuse of a portion of the NUWC site for development of a state park creates an opportunity for improvement of the Fort Trumbull area consistent with these planned projects. This also presents opportunities to stimulate the local economy, improve waterfront access along the Thames River, make aesthetic and visual improvements, and complement the downtown revitalization efforts.

Planning Process

In June of 1998, the Connecticut Department of Economic and Community Development issued an Environmental

Assessment (EA) for the Fort Trumbull MDP area which concluded that the project could potentially have a significant effect on the environment. Several major areas of concern were identified in the EA, including the possible acquisition of residential properties and relocation of residents; adequacy of the existing water supply; congestion and traffic safety issues; historic importance and archaeological significance of the project area; flooding; and stormwater management. As a result of DECD's finding, the subject Environmental Impact Evaluation has been undertaken.

The EIE process began in late June 1998. Numerous consultations were engaged to assist in specific phases of the work. Preliminary findings were discussed at numerous neighborhood meetings. Input and review comments are now being solicited from the community and interested public on the Draft EIE. Input has also been solicited from local, state and federal agencies.

Upon completion of a 45 day public comment period of the DEIE (to be concluded on December 28, 1998), the Connecticut Department of Economic and Community Development must forward the following information to the Office of Policy and Management, for determination of the adequacy of the evaluation:

(1) all public notice documentation;

(2) a brief summary of the public hearing, if one is held;

(3) comments received from all interested parties;

(4) the agency decision relative to proceeding with the proposed action; and

(5) a discussion of the intentions for initiation of actions for minimizing impacts.

This constitutes the Record of Decision.

The CEPA process concludes with the review of the EIE and Record of Decision by OPM and their determination of whether or not regulatory requirements have been satisfied. The final EIE is the basis for the implementation of the project. A municipal Development Plan is then created consistent with the findings of the CEPA process. A mandatory public hearing is held upon completion of the MDP. Procedures for the adoption of the MDP are set forth in Section 32-224(c) of the Connecticut General Statutes. This process must include a finding by the OPM that the plan is not inimical to the overall goals and objectives of the state. Upon obtaining such a finding, the plan would then be legally adopted by the city and approved by DECD.

Project Goals

The project goals for the Fort Trumbull area have been defined as follows:

1. To create a world-class development that will complement the undertakings of Pfizer, Inc. and set a standard for development in New London.
2. To create an economic asset for the City of New London that will create jobs, generate tax revenue, and result in spin-off economic activity.
3. To maximize public access to the waterfront and, in doing so, encourage uses which are water dependent or which will be enhanced by water access and views.
4. To develop a project which will help build momentum for the revitalization of downtown New London and the balance of the city to the benefit of the city's residents and visitors.

Alternatives Evaluated

A variety of potential uses have been evaluated for the Fort Trumbull area. However, a preferred alternative has not yet been selected. It is anticipated that the ultimate selected preferred plan may be a hybrid of several of the alternatives evaluated herein. Major project components are highlighted below:

- Approximately 16 acres of the land currently occupied by the U.S. Naval Undersea Warfare Center will be transferred to the Department of Environmental Protection to establish the Fort Trumbull State Park, providing open space for passive and active recreation as well as preservation of this historic site as a cultural resource. One small parcel of the NUWC site will remain in the possession of the U.S. Coast Guard and a second will remain in the possession of the U.S. Navy for their continued use. The remainder of the property is anticipated to be improved and developed, either through public sale or through another form of conveyance.
- Upgrades to the existing regional Water Pollution Control Facility are planned to reduce odors, improve aesthetics, and improve the quality of treated wastewater.

- Stormwater quality will be improved via the installation of an updated stormwater collection and treatment system.
- Roadway and traffic improvements are planned to accommodate increased projected traffic in the area and to overcome existing deficiencies.
- The following land use alternatives are under consideration:

  Alternative No. 1 – No Action

  Alternative No. 2 – Recreation/Tourism

  Alternative No. 3 – Residential/Commercial

  Alternative No. 4 – Business Campus

  Alternative No. 5 – Mixed Use 1

  Alternative No. 6 – Mixed Use 2

Various project elements are common to all of the alternatives except the no action alternative. They include the redevelopment of the NUWC site as a state historic park, a continuous riverfront walkway, water dependent uses at Columbia Cove, Shaw's Cove, and along Bentley Creek, and research and development land use west of Pequot Avenue.

A brief description of the six alternatives follows.

Alternative 1 – No Action – One of the requirements of CEPA is to evaluate a no action alternative. In this particular instance, no action is somewhat unusual in that other activities and plans would likely proceed even if there were no MDP action.

Under the no action scenario, it is assumed that the Navy would proceed with disposition of the NUWC property as

planned prior to the introduction of the MDP process, in accordance with the approved Local Reuse Authority's (LRA) preferred plan. The LRA's preferred plan indicated disposition of the NUWC property through conveyance of the southern portion to the Department of Environmental Protection for future development of a state park, public benefit conveyance of a portion of the property near Columbia Cove for maritime uses, and public sale of the remaining area.

Alternative 2 – Recreation/Tourism – This alternative complements the proposed Fort Trumbull State Park, concentrating recreational, educational, and cultural uses east of the railroad in the Fort Area and at NUWC. Office and retail uses are proposed west of the railroad in the Gateway Area.

Alternative 3 – Residential/Commercial – This alternative highlights a residential component throughout the MDP area, intermixed with the state park and open space recreational areas, and minor amounts of office and retail uses proposed in the Gateway Area.

Alternative 4 – Business Campus – This alternative focuses the majority of land use in the form of office campus and a supporting hotel/conference center, with small amounts of retail and residential uses in the Gateway Area.

Alternatives 5 & 6 – Mixed Use 1 & 2 – These two mixed use alternatives incorporate recreational, residential, commercial office, retail, and hotel/conference uses in different proportions and arrangements.

Potential Impacts

The following presents brief summaries of potential impacts that would be anticipated as a result of implementation of this project.

Land Use and Zoning Impacts – The majority of the Fort Trumbull MDP area has been designated in the Conservation and Development Policies Plan for Connecticut as an Urban Area Regional Center. Regional Centers encompass land areas containing traditional core commercial, industrial, transportation, specialized institutional services, and facilities of intertown significance. State policy seeks to concentrate economic development to the extent possible in major urban centers, promoting infill development and intensification where appropriate. It is also intended to promote stability of urban communities and to support staged, orderly growth of urban development. Regional and local policies and plans are reflective of the regional center designation. This is also reflected in local zoning ordinances of the Fort Trumbull area.

Land use and zoning impacts vary among the six land use alternatives. Alternatives 2 (Recreation/Tourism) and 3 (Residential/Commercial) do not generally meet the goals and objectives of local, regional, and statewide land use policies, whereas Alternatives 1 (No Action), 4 (Business Campus), 5 (Mixed Use 1), and 6 (Mixed Use 2) do.

Socioeconomic Impacts – All six of the land use alternatives would have a positive impact on job creation and generation of tax revenues. These are summarized in Table ES-1

Neighborhood/Housing Impacts – Varying degrees of neighborhood relocation would be required to implement Alternatives 2, 4, 5, and 6. Extensive mitigative measures have been proposed to offset these impacts. In the "no action" alternative there would be no relocation, since all of the land use changes would occur at the NUWC property. In Alternatives 2 (Recreation/Tourism), 4 (Business Campus), and 6 (Mixed Use 2), most or all of the existing residents and businesses would be relocated. Alternatives 3 (Residential/Commercial) and 5 (Mixed Use 1), have the potential to retain some, but not all, of the existing residents and businesses.

Aesthetic/Visual Resource Impacts – All of the Alternatives would result in aesthetic and visual improvements. Alternative 1 would only involve the NUWC property, and therefore improvements would be less widespread. Implementation of Alternatives 2 through 6 would result in aesthetic improvements to the Water Pollution Control Facility, creation of a waterfront riverwalk, landscaping improvements, and demolition of decrepit buildings.

TABLE ES-1
Summary of Socioeconomic Impacts

Land Use Category	Alt. 1 No Action	Alt. 2 Recreation/ Tourism	Alt. 3 Residential/ Commercial	Alt. 4 Business Campus	Alt. 5 Mixed Use 1	Alt. 6 Mixed Use 2
Direct Employment –Low	1,080	506	335	1,332	574	591
Direct Employment – High	1,779	1,019	710	2,289	1,099	1,124
Indirect Job Creation – Low	802	337	220	949	385	394
Indirect Job Creation – High	1,321	659	452	1,610	720	734
Construction Costs – Low	$3,200,000	28,231,500	40,131,680	56,752,040	43,713,320	48,943,320
Construction Costs – High	$12,000,000	58,098,330	64,249,500	104,202,900	72,893,250	79,402,750
Construction Wages – Low	$1,440,000	12,704,175	18,059,256	25,538,428	19,670,994	22,024,494
Construction Wages – High	$5,400,000	26,144,249	28,912,275	46,891,305	32,801,963	35,731,238
Construction Employment – Low	38	331	470	665	512	574
Construction Employment – High	141	681	753	1,222	854	931
Tax Revenues – Low	$61,152	375,704	603,116	931,651	671,562	771,507
Tax Revenues – High	$229,320	946,459	1,064,008	1,838,437	1,229,190	1,353,587

Source: Marshall Valuation Service and RKG Associates, Inc.

Public Utilities and Services Impacts – Utility improvements would be necessary under all of the alternatives. This work is anticipated to be conducted within existing or future roadway right-of-ways and not impact adjacent land uses. Under all land use alternatives, the existing storm drainage system will need to be modified to accommodate new roadway alignments and improvements and to correct deficiencies in the existing system. The storm drainage systems will incorporate stormwater quality renovation elements and/or infiltration systems to meet stormwater general permit requirements.

Energy Use and Conservation – There is no known data readily available on historic energy use in the Fort Trumbull MDP area and guidelines have not been prepared for future energy use. In general, it is anticipated that new buildings will be more energy efficient than the older existing buildings, and will need to conform to or exceed current standards.

High electrical-demand uses are not proposed under any of the identified land use alternatives. However, it is anticipated that individual users will take advantage of energy-saving measures and available incentives. Additionally, future development projects will be designed in accordance with applicable state and local building codes with respect to electrical components, lighting, and HVAC.

Cultural Resources Impacts – Potential impacts to cultural resources would result under all of the land use alternatives. However, extensive mitigation measures have been proposed to offset these impacts. The Connecticut Historic Commission has reviewed and agreed with the proposed course of action.

Traffic and Parking Impacts – All of the land use Alternatives will result in additional traffic in the Fort Trumbull area. The "no action" alternative (Alternative 1) results in the highest peak hour traffic. Under Alternatives 2 through 6, mitigation measures have been proposed to offset these impacts.

Water Resource Impacts – Minimal water resource impacts are anticipated under any of the alternatives. Improvement to stormwater management is expected in any case.

Flood Hazard Impacts – Much of the Fort Trumbull MDP area is located in the flood hazard zone. Redevelopment of a portion or all of the area would present an opportunity to floodproof buildings or construct new buildings in accordance with FEMA and DEP standards. An evacuation plan would be developed under Alternatives 2 through 6, as well as roadway modifications to improve ingress and egress in the area.

Physical Environment Impacts – Minimal physical impacts are anticipated under any of the alternatives.

Air Quality Impacts – As there will be additional traffic generated as a result of implementation of any of the identified alternatives (including the no action alternative), localized air quality impacts will also result. However, these are expected to be minimal and will not be regionally significant. It should be noted that the "no action" alternative (i.e. no MDP action) would result in the highest peak hour traffic, with no associated roadway improvement mitigation.

Noise Impacts – There will be increases in off-site traffic levels, particularly along Howard Street and Bank Street

as a result of the planned Pfizer facility as well as proposed uses within the Fort Trumbull MDP area. It is anticipated that increased traffic will create noise that will be consistent with an urban transportation hub. However, the geometric and lane improvements at intersections will minimize changes in noise from motor vehicles. Electrification of the Amtrak rail line is expected to lessen rail operation related noise.

Solid Waste and Hazardous Materials Impacts – The need for and extent of site remediation will be governed by the relevant statutes and regulations affecting such activities. Implementation of any of the alternatives would result in the clean-up of contaminated soil, waste containers, and aging material storage tanks.

Cumulative Impacts

Positive cumulative impacts are anticipated as a result of implementation of this project with respect to economic growth through job and tax revenue creation, parks and recreational facilities, public access, wetland restoration, aesthetics, site remediation, improved stormwater management, and additional flood protection. Negative impacts are expected with respect to traffic, air quality, noise, cultural resources, neighborhood relocation, and possibly marine water resources.

Unavoidable Impacts

Unavoidable impacts caused by demolition and construction are anticipated with respect to air and noise quality, as well as short-term increased equipment traffic and use.

Unavoidable long term impacts are expected in the areas of traffic, air quality, noise, and cultural resources.

Irreversible and Irretrievable Commitment of Resources

The implementation of any of the six alternatives would consume non-renewable resources during the construction and implementation (i.e., construction supplies, fuel, etc). Since these resources can not be reused, they are considered to be irreversibly and irretrievably committed. Similarly, disposal of demolition material at a landfill and/or solid waste disposal facility will take up capacity in such facilities which is irreversible and irretrievable.

Mitigation Opportunities

Mitigation opportunities have been evaluated for each of the identified resources. The areas that have been evaluated in the greatest detail and for which the greatest number measures have been proposed are those which have the greatest potential to have impacts. These include traffic and transportation, neighborhood relocation, sensitive cultural resources, and flood hazard areas.

1.0 PURPOSE AND NEED

1.1 Introduction

1.1.1 Project Background

The New London Development Corporation (NLDC), in association with the Connecticut Department of Economic and Community Development (DECD), is undertaking a planning project adjacent to the Thames River in New London, Connecticut. Figure 1.1-1 is a location plan of the City of New London and

New London County. Figure 1.1-2 shows the project area in relation to downtown New London. The project area includes the U.S. Navy's closed Naval Undersea Warfare Center (NUWC), the regional Water Pollution Control Facility (WPCF), and the adjacent Fort Trumbull area as shown in Figure 1.1-3. The project area is also adjacent to the Shaw's Cove Redevelopment Area.

NLDC is a nonprofit, private economic development organization originally formed in 1978. The corporation was established with the authority to raise and borrow funds, manage projects, acquire and sell properties, and engage in any activity related to the progress and general welfare of the community.

Plans for the project area will be prepared in accordance with a Municipal Development Planning process under Section 130, 132, and/or 588(1) of the Connecticut General Statutes. The planning process may result in a recommendation to undertake redevelopment of all or part of the planning area. This Environmental Impact Evaluation (EIE) is being prepared under the Connecticut Environmental Policy Act (CEPA) in conjunction with the Municipal Development Plan (MDP). An Environmental Impact Statement is also being prepared for the disposition of the NUWC property, but has not yet been issued by the Department of the Navy.

The driving force behind this project is the City of New London's desire to revitalize its economy by focusing on the potential offered in the Thames River corridor. The need to stimulate the local economy is heightened by the closing of the NUWC facility in 1996. As many as 1,500 people (not including contractors) were once employed at this complex at its peak in the late 1980's (personal communication, John Templeton, September 30, 1998).

A key catalyst for development of this area is the proposed Pfizer, Inc. global research facility to be located immediately to the south of the MDP boundary. New London Mills previously occupied the site on which Pfizer has proposed its development. The project will involve a private investment of approximately $150 million and is designed to accommodate approximately 2,000 employees.



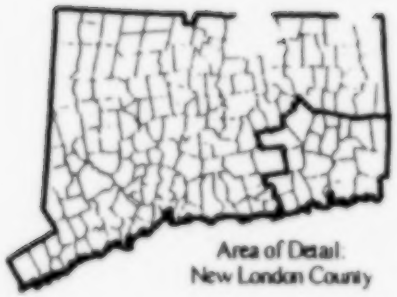
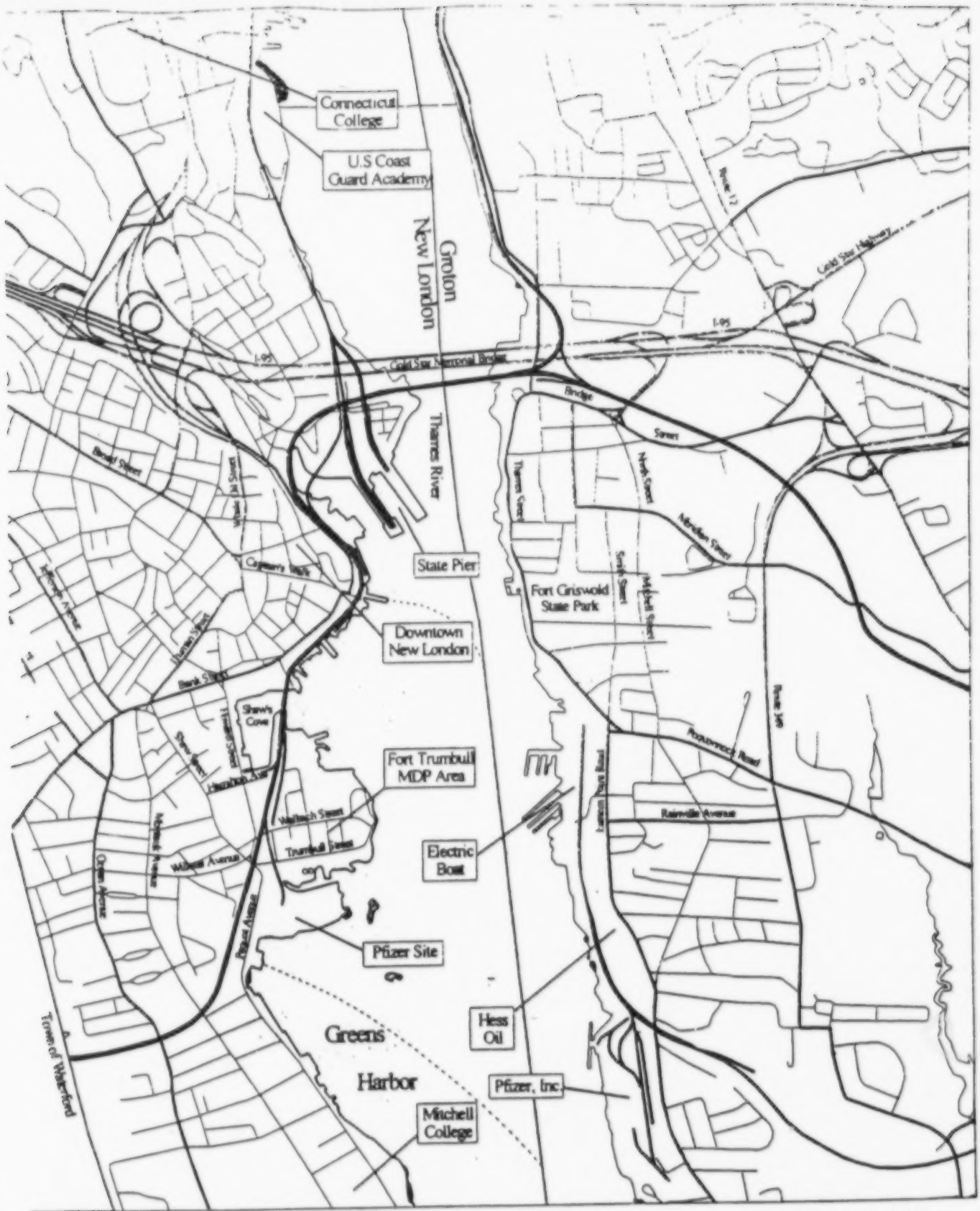




Figure 1.1-1
Location Map - City of New London

Fort Trumbull MDP Area - New London, Connecticut
Draft Environmental Impact Evaluation - November 1998





nbull MDP Area - New London, Connecticut
Environmental Impact Evaluation - November 1998

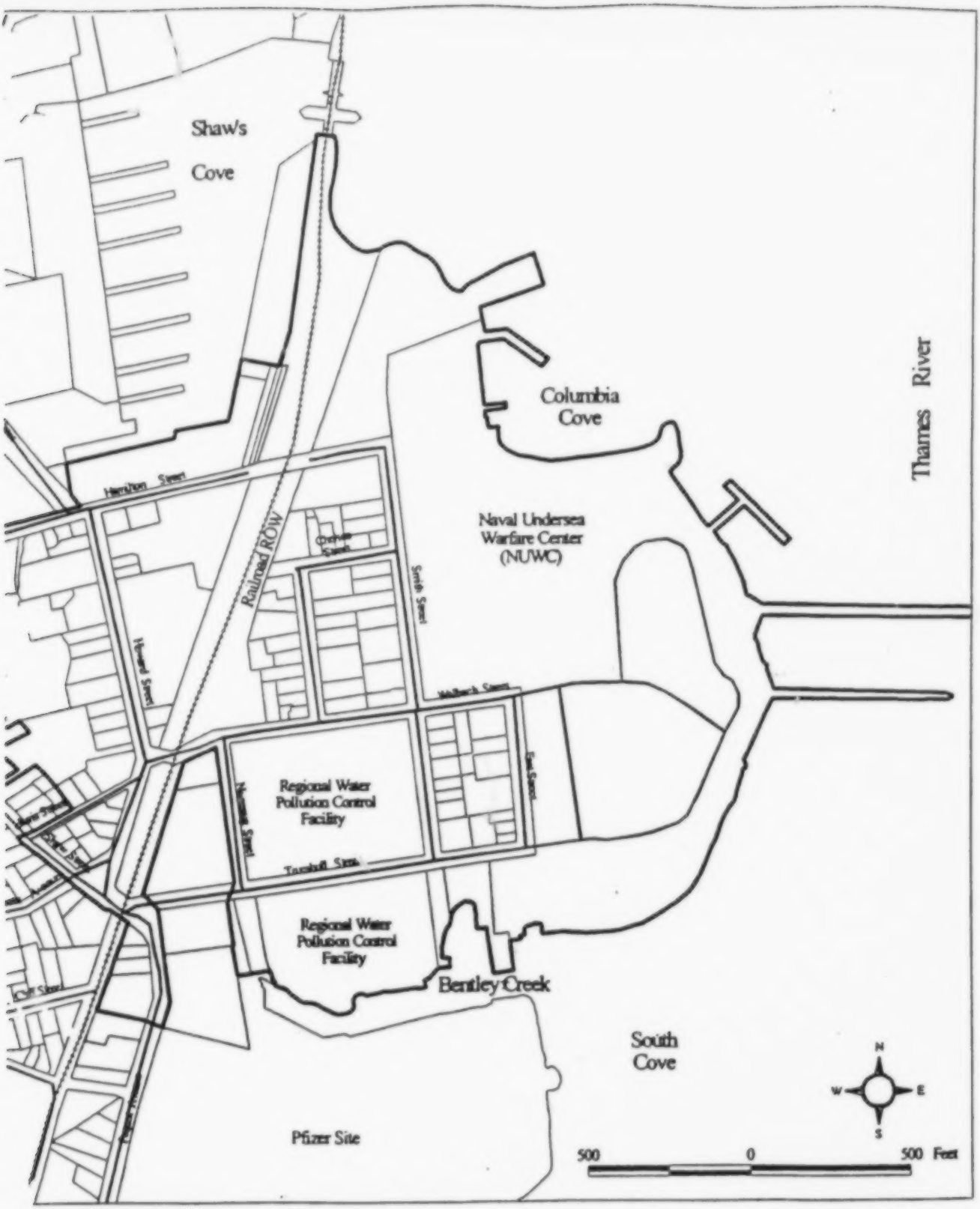
. GIS coverages developed by Milone & MacBroom, and HMA, Inc. Sources include Connecticut DEP, of New London, FEMA, and US Navy. Intended for planning - not for design use.

N
W E
S

Figure 1.1-2
Project Location Map

1000 0 1000 2000 Feet

BEST AVAILABLE COPY



nbull MDP Area - New London, Connecticut
Environmental Impact Evaluation - November 1998

GIS coverages developed by Milone & MacBroom,
nd HMA, Inc. Sources include Connecticut DEP,
f New London, FEMA, and US Navy. Intended for planning
not for design use.

Figure 1.1-3
Project Area

MDP Project Border

In order to induce private investment into the Fort Trumbull area, the State of Connecticut and the City of New London have committed to invest over $64 million. Major categories of public investment include $20 million for the creation of Fort Trumbull State Park on a portion of the NUWC property; $7 million for the upgrade of the regional sewage treatment facility which is located in the Fort Trumbull area; $9 million for environmental remediation of sites; and $24 million for the preparation of a comprehensive plan for the area, for property acquisition, infrastructure development, and other activities to support implementation of the plan. An additional $10.5 million will be available for relocation assistance. Of this amount, $10 million will be in the form of Connecticut Housing Finance Authority (CHFA) low rate financing loan money. Two hundred and fifty thousand dollars will be available in the form of down payment assistance to residents, and an additional $250,000 will be available through Small Business Assistance Program relocation funding.

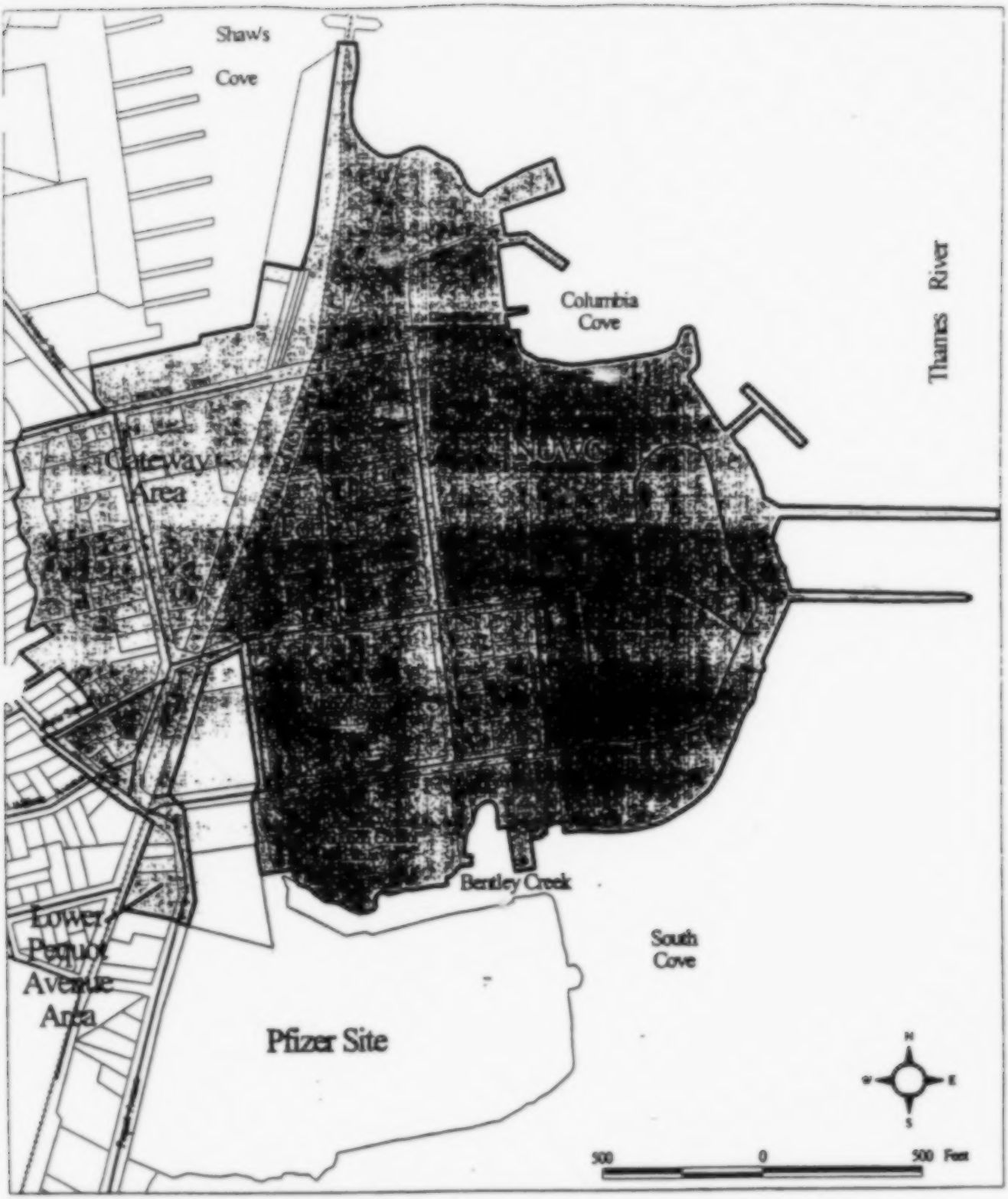
1.1.2 Project Location

The City of New London is located in southeastern Connecticut. It is a waterfront community, along the tidal estuary of the Thames River and Long Island Sound. New London is only 5.79 square miles in size, making it geometrically the second smallest municipality in the State of Connecticut. The estimated 1998 population is 23,860 people based on data published by Claritas, Inc. (State of Connecticut DECD population estimates for 1995 are somewhat higher at 26,920 people.) The community supports several institutions, including Connecticut College, Mitchell College, and the U.S. Coast Guard Academy. Nearly 54% of the total land area of New London is occupied by

nonprofit institutions which are exempt from local property taxes.

The project area is approximately 90 acres in size and includes a residential and commercial area of approximately 115 parcels. The NUWC site alone is 32 acres. For discussion purposes, the MDP area has been segmented into several smaller areas as described below. Figure 1.1-4 delineates the various project planning areas. A brief description of each follows:

Gateway Area – The Gateway Area-is envisioned to be the primary entrance to the MDP area and encompasses the land area to the west of the Amtrak railway. It includes properties on both sides of Howard Street from its intersection with Hamilton Street to the junction with Shaw Street and Trumbull Street. The Gateway Area also includes properties on Hamilton Street between Howard Street and the railroad tracks, as well as properties along Harris Street to the south. This area is currently occupied primarily by commercial properties and parking, intermixed with single- and multi-family residential dwellings, and vacant properties. It occupies approximately 21 acres.



Fort Trumbull MDP Area - New London, Connecticut
aft Environmental Impact Evaluation - November 1998

Note: GIS coverages developed by Milone & MacBroom, Inc. and HMA, Inc. Sources include Connecticut DEP, City of New London, FEMA, and US Navy. Intended for planning only - not for design use.

Figure 1.1- 4
Project Planning Areas

MDP Project Border

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Lower Pequot Avenue Area – The Lower Pequot Avenue Area is a small portion of the MDP area, approximately 1.3 acres in size. It is limited to the four parcels located just south of the junction of Shaw and Trumbull Streets, between the railroad tracks to the west, and Pequot Avenue to the east. This area includes two vacant residential properties, one vacant lot, and one industrial use parcel.

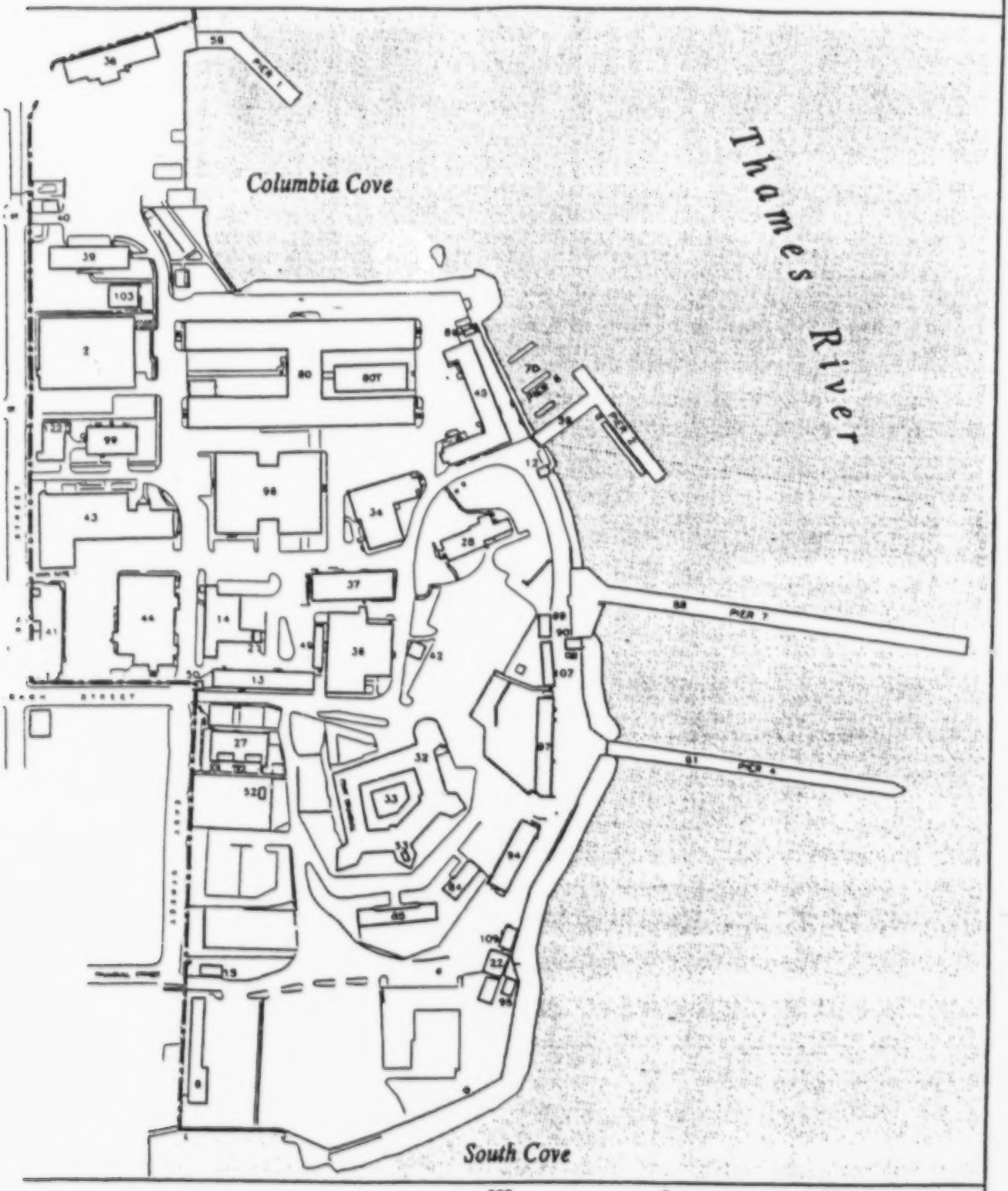
Fort Area – The Fort Area includes all of the property to the east of the Amtrak railroad within the MDP area, exclusive of NUWC. This includes the Amtrak property immediately adjacent to the railroad tracks, as well as properties along Trumbull Street, Nameaug Street, East Street, Walbach Street, Smith Street, Goshen Street, and Chelsea Street. A prominent physical feature of this area is the regional Water Pollution Control Facility (WPCF), which occupies both sides of Trumbull Street from Nameaug Street to Smith Street, comprising approximately 10 acres. Other uses include several residential areas, undeveloped parcels, and a minor amount of commercial and industrial uses. The total land of the Fort Area is approximately 35 acres.

Naval Undersea Warfare Center (NUWC) – Figure 1.1-5 shows the NUWC property and building designations. Building references by name and number are listed in Appendix C. The NUWC property encompasses approximately 32 acres along the Thames River opposite of Smith Street and East Street. The Navy base was closed in 1996 when its staff and operations were transferred to Newport, Rhode Island. The current plan for the property as adopted by the Local Reuse Authority (LRA) contemplates the disposition of 16 acres to the Connecticut Department of Environmental Protection (DEP) for the establishment of the Fort Trumbull State Park; 2.7 acres under consideration for maritime conveyance; 12 acres

for possible future development; and several smaller parcels, including a 1.5-acre parcel and a 0.1-acre parcel, to be retained by the U.S. Coast Guard and the Navy, respectively. The reuse plan for the property is being reevaluated as part of the MDP process. The recommendation of the MDP process will be presented to the LRA for its consideration.

Pfizer Site – The Pfizer site is located on the 24-acre property which was historically occupied by New London Mills, a manufacturer of linoleum. The New London Mills complex was dismantled in the late 1980's and early 1990's. Although the Pfizer site is not part of the Municipal Development Plan (MDP) and is not subject to the CEPA process, this facility is a neighboring property which, when developed, will substantially contribute to the city's economic development objectives. It is being considered in the EIE, primarily due to the cumulative nature of activities in the area.

NUWC New London Site Plan



Mapping provided by TAMS Consultants, Inc.

FIGURE 1.1-5

1.1.3 Project Chronology

The following is a chronology of major activities, events, and milestones to date relating to the Fort Trumbull MDP area:

- 1997 – New London Development Corporation (NLDC) reforms to assist the City of New London in its economic development process.
- January 1998 – The State Bond Commission authorizes $5.35 million in bonds to support planning activities and property acquisition to be undertaken by NLDC in support of the project and $10 million as the first installment toward the investment in the creation of Fort Trumbull State Park.
- February 1998 – Pfizer Inc. announces its intention to develop a facility for clinical trials on the former New London Mills site.
- April 1998 – NLDC hires an executive director, its first employee. The New London City Council gives initial designation to NLDC to prepare a Municipal Development Plan for the Fort Trumbull area.
- April 1998 – NLDC holds the first in a series of informal, neighborhood meetings to include and incorporate public comment on the MDP process. The City Council also creates a committee of six people (two from the Local Reuse Authority (LRA), two from the NLDC, and two from the State of Connecticut) to evaluate the current LRA plan for the disposition of the NUWC property and to consider asking for a delay in the public sale of a portion of this property.
- May 1998 – The New London City Council gives authority to NLDC to prepare plans for the Fort

Trumbull area under any of three state statutes (Section 130, 132, and/or 588(1)) and establishes the boundaries of the planning area. The State Bond Commission approves the second installment of $2.9 million to fund the preparation of a Municipal Development Plan for the area and to fund property acquisition activities. NLDC initiates requests for qualifications from consultants to prepare various aspects of the Municipal Development Plan and Environmental Impact Evaluation under CEPA.

- May 1998 – A consultant is hired by the Water Pollution Control Authority to conduct a study of the possible upgrades to the regional WPCF.
- June 1998 – The City of New London authorizes the conveyance of the former New London Mills site to Pfizer, with the contingency that the State of Connecticut commits to resolve or guarantee resolution of all liens on the property. A total of $6.1 million in additional state bonding authority is approved to support the project.
- June 1998 – The Local Reuse Authority formally requests of the Navy that public sale of properties on the NUWC site be delayed until February 28, 1999 to allow time for the preparation of a comprehensive plan for the Fort Trumbull area through the Municipal Development Plan process. This request is approved by the Navy.
- June 1998 – The final Environmental Assessment under the Connecticut Environmental Protection Act is issued by the Department of Economic and Community Development, with the recommendation to proceed with a full Environmental Impact Evaluation.

- July 1998 – Planning consulting team is hired for the CEPA process and Municipal Development Plan Preparation.

1.2 The CEPA Process

1.2.1 Overview of Regulation

The Connecticut Environmental Policy Act (CEPA), established in Sections 22a-1 through 22a-1h of the Connecticut General Statutes, recognizes the complex relationship between the natural environment and human actions, including population growth, high-density urbanization, industrial expansion, natural and cultural resources, and technological advances. The Regulations of Connecticut State Agencies (Sections 22a-1 through 22a-1a-12) outline a process whereby, through coordination with other state, local, regional and federal governments, as well as public and private entities, a sponsoring state agency can evaluate and minimize the projected impacts of a project to the resources of the state.

State funds will be utilized in the Fort Trumbull MDP area, thus triggering the CEPA process. The sponsoring state agency is the Connecticut Department of Economic and Community Development (DECD). NLDC is the implementing agency.

1.2.2 Determination of Environmental Significance

A major function of the CEPA process is the determination of whether a project will have a significant effect. Significant effect is defined as substantial adverse impact on the environment. Agencies preparing such CEPA documents must consider the following two factors: (1) direct and indirect effects and, (2) cumulative impacts.

Environmental Assessment

The first phase of the CEPA process is development of an Environmental Assessment (EA). In this work task, existing data and information are evaluated in a relatively fast track process to assess whether a project may potentially cause a significant environmental impact. In some cases, a determination is made that additional site specific and more intensive study is necessary to make that determination. In other, less complex cases, a Finding of No Significant Impact (FONSI) is issued at the conclusion of the EA process.

In July 1998, the Connecticut Department of Economic and Community Development issued an Environmental Assessment for the Fort Trumbull MDP area and determined that the project could potentially have a significant effect on the environment. A copy of this is included as Appendix A. Several major areas of concern were identified in the EA, including the possible acquisition of residential properties and relocation of residents; adequacy of the existing water supply; congestion and traffic safety issues; historic importance and archaeological significance of the project area; flooding; and stormwater management. As a result of DECD's finding, the subject Environmental Impact Evaluation has been conducted.

Environmental Impact Evaluations

The Environmental Impact Evaluation (EIE) process is intended to be an early planning process during which options are discussed and the impact of each alternative action is compared. Significant issues are identified and analyzed in detail, allowing participation of interested and/or affected agencies and persons.

Public input and participation is a major component of the CEPA process. Early scoping and information exchange is essential. Section 6.0 of this document contains a detailed accounting of the scoping, consultation, and coordination process that has taken place to date. The overall process for public participation is summarized as follows:

- A period of no less than forty-five (45) days must be provided for notice, distribution, and review of the Draft Environmental Impact Evaluation by any interested parties.
- Upon receiving comment, the sponsoring agency must review comments, perform any additional environmental study and analysis, or amend the evaluation as appropriate. It is the sponsoring agency's responsibility to respond to all substantive comments received.
- A public hearing may be held, if requested in accordance with state statutes, regulations, and Section 22a-1a-11 of the regulations. A period of no less than thirty (30) days following the date of availability of the EIE must be provided before such public hearings.
- The sponsoring agency (in this case the Department of Economic and Community Development) must forward the following information to the Office of Policy and Management, for determination of the adequacy of the evaluation: (1) all public notice documentation; (2) a brief summary of the public hearing, if one is held, (3) comments received from all interested parties; (4) the agency decision relative to proceeding with the proposed action; and (5) a discussion of the intentions for initiation of actions for minimizing impacts. This constitutes the Record of Decision

(final EIE document and the measures for mitigation identified therein).

- The CEPA process concludes with the review of the EIE and Record of Decision by OPM and their determination of whether or not regulatory requirements have been satisfied. The final EIE is the basis for the implementation of the project.
- A Municipal Development Plan is then created consistent with the findings of the CEPA process. A mandatory public hearing is held upon completion of the MDP. Procedures for the adoption of the MDP are set forth in Section 32-224(c) of the Connecticut General Statutes. This process must include a finding by the OPM that the plan is not inimical to the overall goals and objectives of the state. Upon obtaining such a finding, the plan would then be legally adopted by the city and approved by DECD.

1.3 Project Goals

To date, input has been solicited from local, state and federal agencies. At the local level, this has included various departments and agencies within the City of New London, educational institutions located within the city, the business community, and the New London residential community. At the state level, the Office of the Governor, the Department of Economic and Community Development (DECD), the Connecticut Department of Environmental Protection (DEP), the Connecticut Historical Commission (CHC), the Office of Policy and Management, (OPM), and the Department of Transportation (DOT) have been included. At the federal level, the U.S. Navy and their interests at the NUWC property, the U.S. Coast Guard, and the State Historic Preservation Officer (SHPO) have been

represented. This process creates a vehicle for community input and involvement.

The goals for the Fort Trumbull area have been identified by the committee of six as follows:

1. To create a world-class development that will complement the undertakings of Pfizer, Inc. and set a standard for development in New London.
2. To create an economic asset for the City of New London that will create jobs, generate tax revenue, and result in spin-off economic activity.
3. To maximize public access to the waterfront and, in doing so, encourage uses which are water dependent or which will be enhanced by water access and views.
4. To develop a project which will help build momentum for the revitalization of downtown New London and the balance of the city to the benefit of the city's residents and visitors.

These goals have been carried through the planning and evaluation of alternatives.

1.4 Proposed Action

A variety of potential uses have been evaluated for the Fort Trumbull area. However, a preferred alternative has not yet been selected. It is anticipated that the ultimate selected preferred plan may be a hybrid of several of the alternatives evaluated herein. Major project components are highlighted below:

- Approximately 16 acres of the land currently occupied by the Naval Undersea Warfare Center will be transferred to the Department of Environmental Protection to establish the Fort

Trumbull State Park, providing open space for passive and active recreation as well as preservation of this historic site as a cultural resource. One small parcel of the NUWC site will remain in the possession of the U.S. Coast Guard and a second will remain in the possession of the U.S. Navy for their continued use. The remainder of the property is anticipated to be improved and developed, either through public sale or through another form of conveyance.

- Additional land use improvements are proposed for the remainder of the Fort Trumbull area. The following-land use alternatives are under consideration. These are described in detail in Section 3.0 of this document.

  Alternative No. 1 – No Action
  Alternative No. 2 – Recreation/Tourism
  Alternative No. 3 – Residential/Commercial
  Alternative No. 4 – Business Campus
  Alternative No. 5 – Mixed Use 1
  Alternative No. 6 – Mixed Use 2

- Upgrades to the existing regional Water Pollution Control Facility are planned to reduce odors, improve aesthetics, and improve the quality of treated wastewater.

- Stormwater quality will be improved via the installation of an updated stormwater collection and treatment system.

- Roadway and traffic improvements are planned to accommodate increased projected traffic in the area and to overcome existing deficiencies.

1.5 Relationship to Other Projects and Planning Documents

For the purposes of this EIE, numerous planning documents have been evaluated in the context of the Fort Trumbull area to ensure that this planning effort is consistent with relevant state, regional, and local planning policies. These are summarized below.

State Planning Documents

- Conservation and Development, Policies Plan for Connecticut, 1998-2003, Office of Policy and Management, Hartford, CT.

- Connecticut Environmental Goals and Indicators, Connecticut Institute of Water Resources, University of Connecticut, September 30, 1996.

- Environment/2000: Connecticut's Environmental Plan, Connecticut Department of Environmental Protection and The Commissioner's Environment/2000 Advisory Board, Draft October 1997.

- Reference Guide to Coastal Policies and Definitions, Connecticut Department of Environmental Protection, Rev. January 1996.

Regional Planning Documents

- Southeastern Council of Governments, Land Use, 1990, February 1991.

- Southeastern Council of Governments, Population and Housing, 1990, March 1992.

- Southeastern Council of Governments, Social Indicators, 1990, February 1995.

- Southeastern Council of Governments, Proposed Regional Conservation and Development Policy

Guide for Southeastern Connecticut (DRAFT), July 1997.

Local Planning Documents

- Plan of Conservation and Development, City of New London, CT. Prepared by: The Office of Development and Planning and the New London Plan of Development Steering Committee, March 1, 1997 (Adopted April 3, 1997).
- Zoning Regulations, City of New London, CT, Planning and Zoning Commission, as amended through September 1, 1998.

Other Related Documents

A great deal of work has been conducted to date by the Navy on the NUWC property. The NUWC property lies within the MDP boundary and, therefore, the EIE has considered following planning and site investigation documents:

- Feasibility Report, Naval Undersea Warfare Center, Fort Trumbull State Park, June 18, 1997, Amended: December 1997.
- Implementation Strategy, Naval Undersea Warfare Center, New London, CT, Economics Research Associates and Sasaki Associates, Inc., April 17, 1997.
- Redevelopment Strategy, Naval Undersea Warfare Center, New London, CT, Economics Research Associates and Sasaki Associates, Inc., April 17, 1997.
- Draft Cultural Resources Survey; Naval Undersea Warfare Center; New London, Connecticut; TAMS Consultants, Inc.; April 1998.

Additionally, the EIE has considered the neighboring Pfizer, Inc. development through ongoing coordination with Pfizer representatives. Pfizer is planning an 800,000 square foot global research and development facility. The site of the Pfizer complex is located immediately to the south of the Fort Trumbull MDP area, between Pequot Avenue and Trumbull Street, on property which was previously occupied by New London Mills.

2.0 AFFECTED ENVIRONMENT

2.1 Land Use

An understanding of land use plans and policies at the local, regional and state levels is essential to the analysis of potential alterations of land uses. The following discussion sets the framework of land use policies which apply to the Fort Trumbull MDP area. Consistency of identified project alternatives (presented in Section 3.0) with these plans, policies, statutes, and regulations is evaluated in Section 4.0 of this document.

2.1.1 Statewide Land Use Conservation and Development

The following discussion presents portions of the *Conservation and Development Policies Plan for Connecticut* (1998-2003) as they relate to the Fort Trumbull MDP project. Italicized sections are direct excerpts from the Plan. Not all Plan policies are included in this discussion, as they may not directly apply. For an expanded review of the Plan, the reader is directed to the full 141-page document.

The Conservation and Development Policies Plan for Connecticut (1998-2003) is a statement of the state's growth, resource management, and public investment

policies. The Plan provides a policy and planning framework for the administrative and programmatic actions and capital and operational investment decisions of state government, which influence the future growth and development of the state. The objective of the Plan is to guide a balanced response to human, environmental, and economic needs in a manner which best suits the future of Connecticut. The Connecticut General Assembly, in accordance with Sections 16a-24 through 16a-33 of the Connecticut General Statutes, established the Plan.

Public Act 91-395 requires state agencies to be consistent with the Plan when undertaking certain actions, including authorization of state grant money in excess of $100,000 for the acquisition, development, or improvement of real property. The MDP project will receive state funding as described in Section 1.0 of this document. Therefore consistency with the state Plan is evaluated herein.

The accompanying Conservation and Development Plan Locational Guide Map apportions the state into land categories according to each area's characteristics and suitability for different forms of development or conservation activities. The categories of land use are designated on the Locational Guide Map as follows:

Urban Areas

- Regional Centers
- Neighborhood Conservation Areas
- Growth Areas

Areas of Environmental Concern

- Existing Preserved Open Space
- Preservation Areas
- Conservation Areas

Rural Areas

- Rural Community Centers
- Rural Land

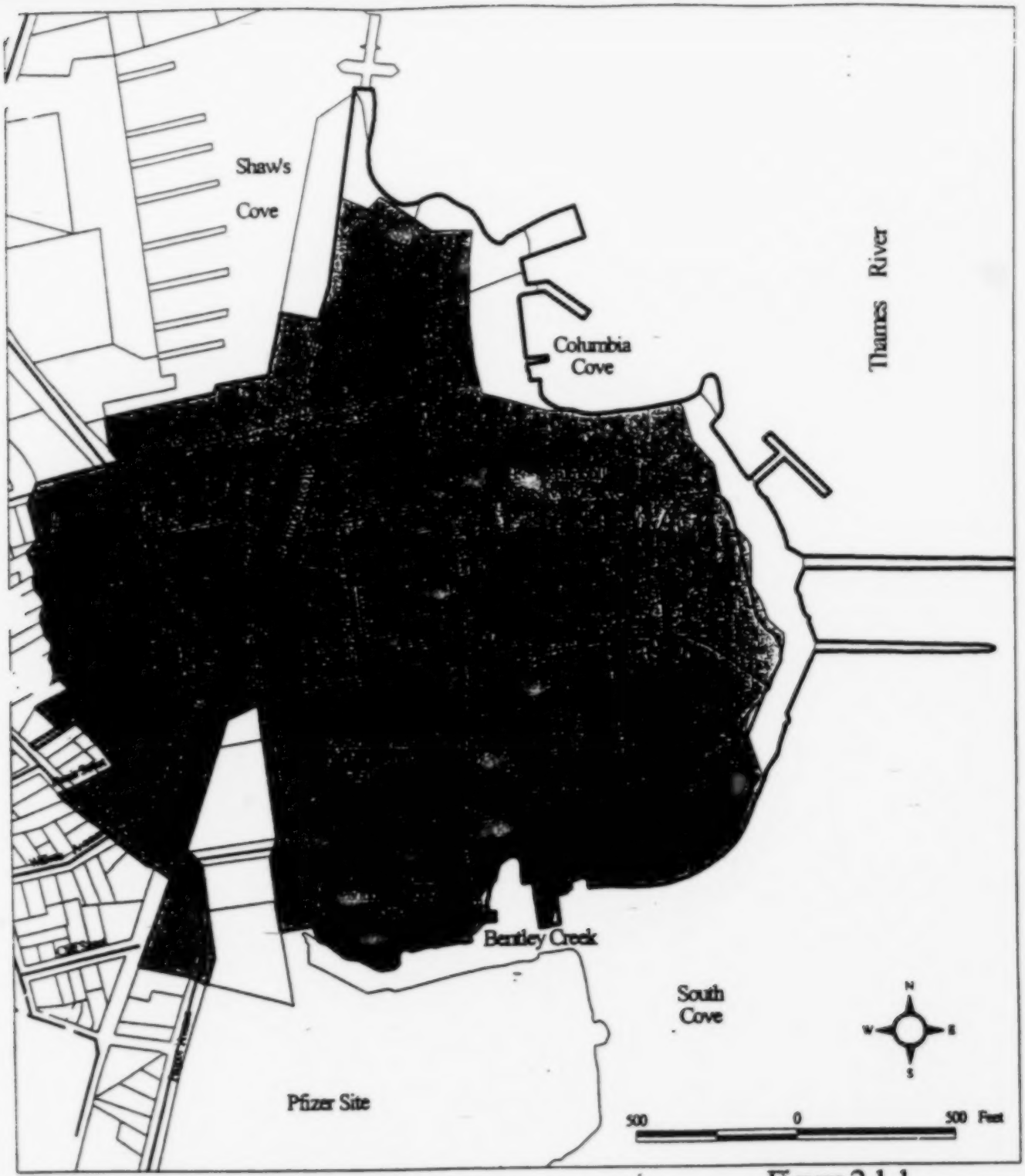
Figure 2.1-1 shows the statewide conservation and development plan land designations for the project area. The majority of the Fort Trumbull area is classified as a Regional Center, with most of the balance of the project area classified as Conservation Area. Small areas of Preservation and Existing Preserved Open Space are also designated on the Locational Guide Map. Descriptions of land use designations in the project area are presented below.

Regional Centers

Regional Centers encompass land areas containing traditional core area commercial, industrial, transportation, specialized institutional services, and facilities of intertown significance.

Section 4-66b of the General Statutes sets forth the following urban goals to be used to assess consistency of a proposed action with state policy:

- *to revitalize the economic base of our urban areas by rebuilding older commercial and industrial areas and encouraging new enterprises to locate in the central cities in order to protect existing jobs and create new job opportunities needed to provide meaningful economic opportunity for inner city residents;*
- *to revitalize urban neighborhoods to reduce the isolation of various income, age, and minority groups through the promotion of fair and balanced housing opportunities for low and moderate-income residents;*



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ort Trumbull MDP Area - New London, Connecticut
f ٩ Environmental Impact Evaluation - November 1998

Figure 2.1-1
Conservation and Development
Policies Plan Location Map

MDP Project Border
Conservation Areas
Existing and Preserved Open Space
Preservation Areas
Regional Centers

Note: GIS coverages developed by Milone & MacBroom, Inc. and HMA, Inc. Sources include Connecticut DEP, City of New London, OPM, and US Navy. Intended for planning only - not for design purposes.

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- *to revitalize the quality of life for the residents of our urban areas by ensuring quality education, comprehensive health care, access to balanced transportation, adequate recreational facilities, responsive public safety, coordinated effective human services programs, decent housing, and employment opportunities; by preserving the scarce resources of pure air and clean water; and by ensuring full and equal rights and opportunities for all people to reap the economic and social benefits of our society; and*

- *to coordinate the conservation and growth of all areas of our state to ensure that each area preserves its unique character and sense of community and further ensure a balanced and prudent use of our state's scarce resources.*

State policy seeks to concentrate economic development to the extent possible in major urban centers, promoting infill development and intensification where appropriate. It is also intended to promote stability of urban communities and to support staged, orderly growth of urban development.

The highest priority has been assigned to affirmatively supporting rehabilitation and revitalization of the economic, social, and physical environment of Regional Centers. State policy supports a range of public facilities, services, and amenities that serve to encourage private investment in development forms consistent with urban strategies. As a result, the following approach and guidelines are among those identified in the *Conservation and Development Policies Plan* for Growth Areas (i.e. lands near Regional Centers that provide the opportunity for staged urban expansion generally in conformance with municipal or regional development plans).

- *target economic development assistance emphasizing site cleanup, land assembly, structural rehabilitation; and the location of labor-intensive businesses to revitalize the economic base of Regional Centers, to encourage new enterprises and create new opportunities for urban residents;*
- *give priority to infrastructure proposals that provide needed growth capacity in Regional Centers;*
- *support new product development and facilities for start-up firms, especially those that provide some entry level employment opportunities and which are strategically suited to their communities (can compete in local markets or complement a regional economic cluster);*
- *scrutinize regulatory processes and seek to simplify, streamline, or eliminate those rules that unduly hinder economic development in urban areas, while ensuring continuing efficient protection of public safety, health and the environment;*
- *locate all appropriate state facilities within urban areas with preference to sites in Regional Centers;*
- *promote recreational uses of urban rivers and their banks as part of a greenway system and the protection, interpretation, and public use of other urban natural resources;*
- *develop heritage parks where appropriate to foster tourism and recreational opportunities and to display and interpret local history;*
- *promote, to the extent possible, the concentration of major facilities on public transportation routes at employment densities of at least 50 employees per acre.*

Conservation Areas

Conservation Areas represent a significant portion of the state and a myriad of land resources. Conservation areas include flood fringe areas that are, or may be, defined under the National Flood Insurance Programs, Connecticut's Channel Encroachment Line Program, or the Coastal Area Management Program, as areas subjected to 100-year flood and not included in the floodway. Historic preservation areas are also included in Conservation Areas.

To attain the widest range of beneficial public uses and appropriate development, state actions in Conservation Areas should be designed to:

- *promote research, education, resource management, regulations, financial, and technical assistance or public acquisition as necessary to achieve proper use and protection of Conservation Areas;*
- *undertake or support only those uses that are compatible with the resource or hazard of concern, consistent with evaluations of both direct and secondary impacts;*
- *demonstrate the lack of alternative sites, overriding social or economic concerns, and the lack of any reasonable alternative public or private uses for any proposal which is clearly and significantly incompatible with conservation; and*
- *include mitigation measures necessary to both protect against degradation and enhance environmental quality.*

Preservation and Existing Preserved Open Space Areas

A narrow fringe of land along the waterfront edge within the MDP area has been classified as

Preservation Area, due to its proximity to the waterfront and associated flood hazard characteristics. State policies regarding preservation areas promote preservation and management of these areas as open space. Plans and proposals that are incompatible with open space uses should demonstrate overriding public benefits and the lack of viable alternative sites.

A small triangular parcel formed by Howard Street, Harris Street, and Shaw Street has been classified as Existing Preserved Open Space. It is unclear why this designation has been assigned, since this land area is currently developed. This area should be redesignated by OPM during its next revision to the Plan.

2.1.2 Regional Land Use

The Southeastern Connecticut Region consists mostly of the suburban municipalities of Colchester, East Lyme, Griswold, Ledyard, Lisbon, Montville, Preston, Sprague, Stonington, and Waterford surrounded by the rural towns of Salem, Bozrah, Franklin, Voluntown, and North Stonington. Norwich, Groton, and New London are the urban centers, making up approximately 11.3% of the 559.2 square miles of the Southeastern Connecticut Region.

Approximately 21% of the region is occupied by intensive land uses, leaving a rather large portion (61%) of undeveloped lands. Several factors limit the ability to intensively develop areas in the southeastern Connecticut region, including poorly drained soils, shallow depth to bedrock, steep slopes, flood hazard areas, availability of utilities, ownership, zoning, financing, and regulatory jurisdictions of state and federal governments.

The major development contributing to regional growth has occurred at low densities, more in the

rural and suburban towns than the three urban municipalities, although urban growth continues along the Thames River corridor and the Long Island Sound coast, and more recently along Interstate 95.

The region has had a historic dependence on defense related industries. The end of the Cold War significantly altered regional land use patterns, with the reduction of defense-related industries and manufacturing. It is further expected that dramatic changes will continue to occur with the increase in gaming facilities and associated development. (*Regional Conservation and Development Policy Guide for Southeastern Connecticut*, October 1997)

It is the goal of the Southeastern Connecticut Council of Governments (SCCOG) that diversified and balanced development be sought in the region and opportunities be created in an effort to minimize dependence on a single industry for employment, thereby reducing the strain of high unemployment rates on the region's economic health.

2.1.3 Land Uses in the Project Vicinity

Development in southeastern Connecticut is concentrated primarily along the coastline of Long Island Sound and along the Thames River. Single-family and multi-family residential areas, commercial establishments, and open space areas generally occur inland of the densely developed coastline.

On the western bank of the Thames River, north of the project area, are the Shaw's Cove area and downtown New London which supports commercial uses and major transportation uses, including ferry services, passenger rail, and a major parking facility. Further north are the State Pier, the Goldstar Memorial bridge, Connecticut College and the U.S. Coast

Guard Academy. To the south along the western bank of the Thames River are Greens Harbor, Mitchell College, and Ocean Beach.

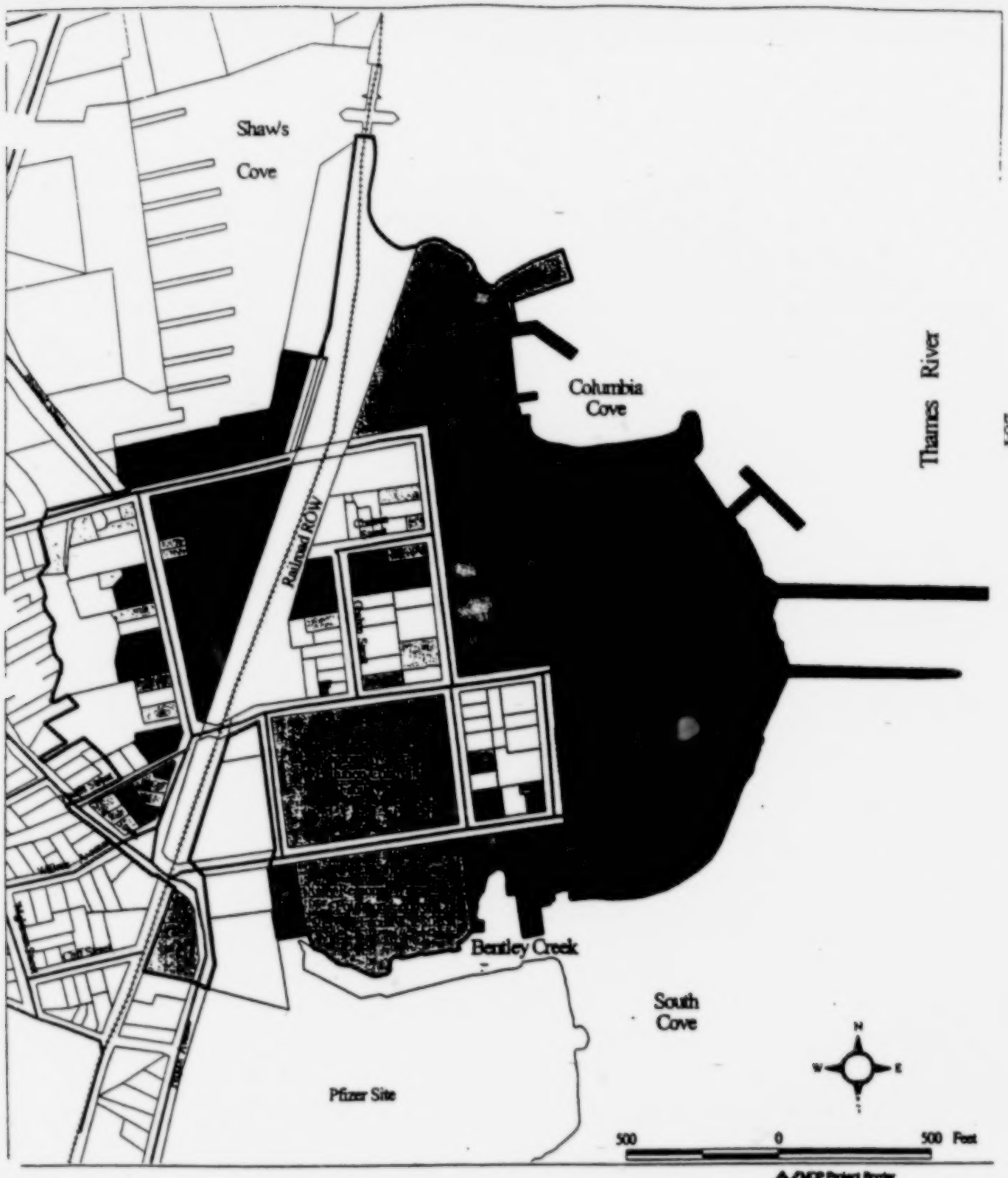
Major land uses on the eastern bank of the Thames River, across from the project area, include General Dynamic's Electric Boat facility, Pfizer Pharmaceutical Company, and Fort Griswold.

Other noteworthy land uses in the surrounding regional area include Crystal Mall in Waterford, Foxwoods Casino in Ledyard, Mohegan Sun Casino in Montville, and Mystic Seaport and Aquarium in Stonington. Nearby open space areas include Harkness Memorial State Park in Waterford, and Bluff Point State Park and Fort Griswold in Groton.

Land uses immediately surrounding the Fort Trumbull area consist of waterfront uses dominated by harbors and marinas, commercial uses, and mixed residential and office/commercial areas.

2.1.4 Land Uses Within the MDP Boundary

Figure 2.1-2 depicts existing land uses in the project area. Land use within the MDP area includes the NUWC facility, the regional Water Pollution Control Facility, a mixed residential/commercial area, and single- and multi-family neighborhoods. A description of land uses in the four project planning areas follows.



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rort Trumbull MDP Area - New London, Connecticut
I t Environmental Impact Evaluation - November 1998

ote: GIS coverages developed by Milone & MacBroom Inc. and HMA, Inc. Sources include Connecticut DEP, City of New London, and US Navy. Intended for planning only - not for design purposes.

Figure 2.1-2
Land Uses in
the Project Area

Gateway Area

The portion of the project area located to the west of the railroad tracks consists of commercial and industrial establishments intermixed with single- and multi-family residences. The Miner & Alexander Lumber Company is the major commercial establishment located between Hamilton Street and Shaw's Cove. The largest building in this area is a 50,000 square foot office building located at 194 Howard Street. This structure has been vacant but is being renovated for office use. Businesses, office buildings, and residences occur along Howard Street. Several undeveloped parcels occur to the west of Howard Street along the western edge of the project area.

Fort Area

A major physical feature in the Fort Area is the regional Water Pollution Control Facility which is bordered by Nameaug Street to the west, Walbach Street to the north, Smith Street to the east, and Bentley Creek to the south. The facility is marked by the massive treatment tanks and buildings associated with the wastewater treatment process.

The remainder of the Fort Area consists primarily of single-family and multi-family residences, with several small businesses, restaurants, and commercial establishments. New London Seafood Distributors is located in the northern portion of the Fort Area near Columbia Cove, and Fort Trumbull Marina is located in the southern portion of the Fort Area along Bentley Creek.

Lower Pequot Avenue Area

Land uses in the Lower Pequot Avenue Area are limited to two vacant residential dwellings, one vacant lot, and one industrial property.

NUWC Area

The eastern portion of the project area, located to the east of Smith and East Streets and bordering the Thames River, is occupied by the Fort Trumbull U.S. Navy Reserve Base, Naval Undersea Warfare Center (NUWC). The base consists of a 19th century fort and blockhouse as well as various laboratories, administrative offices, residences, and other buildings. Several piers on the Thames River are also associated with this facility. This facility has been closed since 1996 and most of the buildings are unoccupied. A staff of approximately 15 people continue to secure and maintain the facility.

2.1.5 History of Development

Aerial photographs of the project area dating back to 1965 were examined to qualitatively document changes which have occurred over the last three decades. A discussion of this review follows.

1965 aerial photograph

In 1965, the project area was densely developed, with a general appearance similar to present day conditions. The following differences are noted:

- The NUWC property had more lawn and parking areas and fewer buildings than it does today. A small bay was present at the southeastern corner of the property.
- The regional Water Pollution Control Facility on Trumbull Street appears much the same as today;

however, the portion of the facility to the north of Trumbull Street had not yet been constructed. This area supported residential houses, a warehouse, and undeveloped land.

- In the western portion of the project area, the undeveloped land between Howard Street and Shaw Street appeared less overgrown than it does today. An open stormwater drainage channel extended north to Hamilton Street. The large parcel between Howard Street and the railroad tracks, now the site of a large office building, supported several factory or warehouse buildings.

1970 aerial photograph

Very little visible change took place within the project area between 1965 and 1970. The open stormwater drainage channel in the undeveloped land between Howard Street and Shaw Street had been piped underground at its northern end, and the remaining open channel appeared much the same as it does today.

1975 aerial photograph

Significant changes occurred at the NUWC property between 1970 and 1975. Several buildings were constructed, including Buildings 2, 80T, 96, 99, and 122T (see Figure 1.1-5). The small bay at the southeastern corner of NUWC had been filled in and a parking lot was constructed on top of it.

The factory or warehouse buildings located on the large parcel between Howard Street and the railroad tracks were demolished, and the site was vacant.

1980 aerial photograph

The portion of the regional Water Pollution Control Facility south of Trumbull Street was constructed between 1975 and 1980. The buildings that had

occupied the site were demolished, with the exception of a large building near the corner of Walbach Street and Smith Street, which remains standing today.

The large parcel between Howard Street and the railroad tracks remained vacant.

1986 aerial photograph

A large office building had been constructed on the vacant parcel between Howard Street and the railroad tracks. North of the study area, the realignment of Howard Street and the construction of the Shaw's Cove office complex was completed.

1990 aerial photograph

Between 1986 and 1990, a parking lot was constructed at the regional Water Pollution Control Facility on the corner of Nameaug Street and Walbach Street. Otherwise, very little visible change occurred in the area during this period.

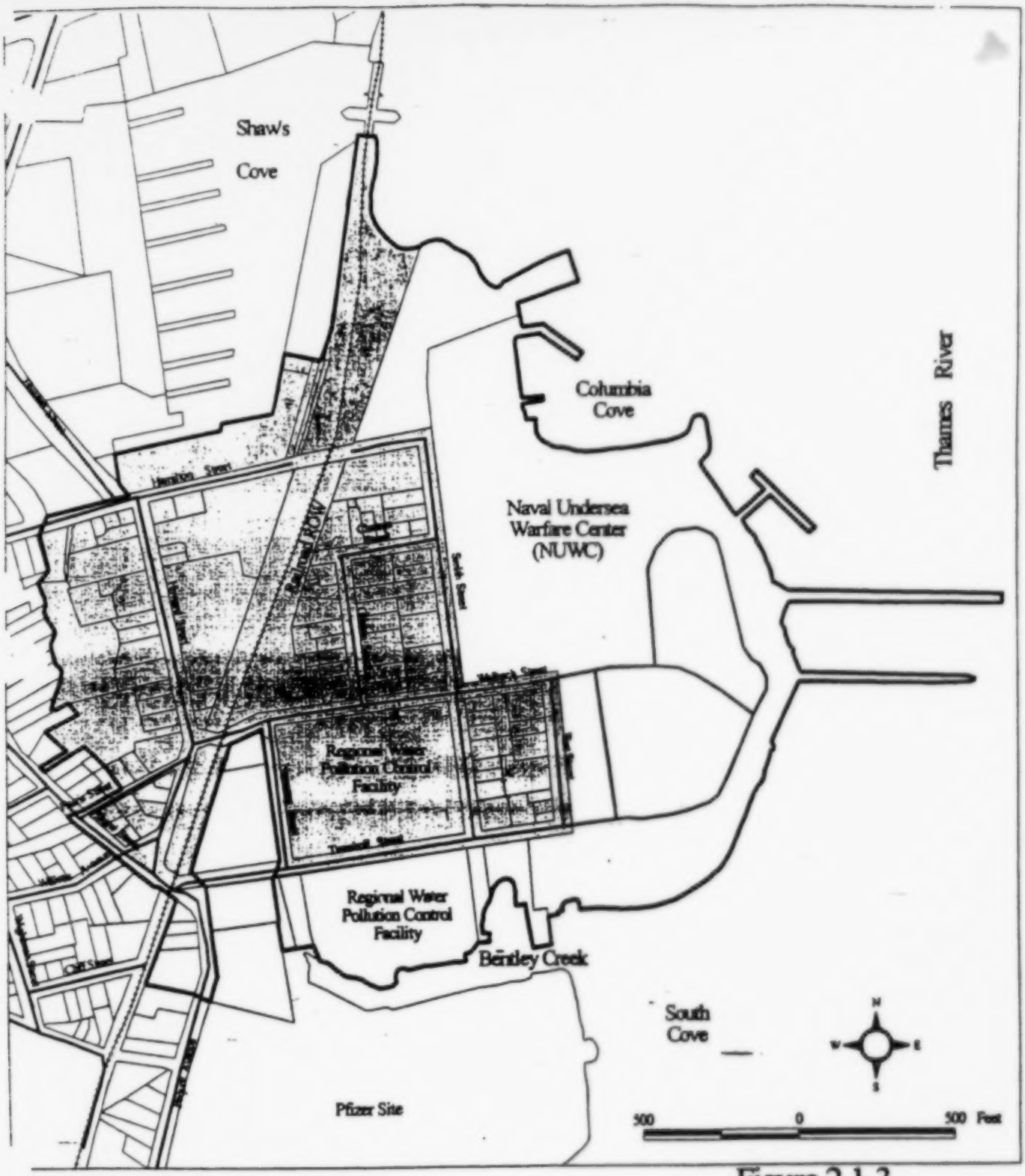
1996 aerial photograph

An additional sewage treatment tank was constructed at the regional Water Pollution Control Facility on the north side of Trumbull Street.

2.1.6 Zoning

Three municipal zones occur within the project area as shown graphically in Figure 2.1-3. These are Waterfront Commercial/Industrial (WC-I), General Commercial District (C-1), and the Waterfront Development District (WD). In many locations within the MDP area, land uses are inconsistent with the zoning designation.

A description of zoning in the project planning areas follows.



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Figure 2.1-3
Zoning in the Project Area

MDP Project Border
C-1 General Commercial District
WCI Waterfront Commercial/Industrial
WD Waterfront Development

F : Trumbull MDP Area - New London, Connecticut
t Environmental Impact Evaluation - November 1998

Note: GIS coverages developed by Milone & MacBroom, Inc. and HMA, Inc. Sources include Connecticut DEP, City of New London, FEMA, and US Navy. Intended for planning only - not for design use.

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Gateway Area

The Gateway Area to the south of Hamilton Street is zoned C-1, General Commercial District. According to the New London Zoning Regulations, the purpose of the General Commercial District is "to provide for a wide range of commercial and limited industrial uses along major arterials; to accommodate uses that benefit from large numbers of motorists, and businesses that are not intensive central business area type activities. New residential development is discouraged except in certain instances." The minimum lot area in the General Commercial District is 5,000 square feet.

The Gateway Area to the north of Hamilton Street is zoned WD, Waterfront Development District. According to the New London Zoning Regulations, the purpose of the Waterfront Development District is to "encourage a mixture of land uses, with emphasis on waterfront access and water dependent and related uses." The minimum lot area in the Waterfront Development District is 20,000 square feet.

Fort Area

Most of the Fort Area is zoned C-1, General Commercial District, from Hamilton Street to Trumbull Street.

The waterfront areas along the southern side of Trumbull Street, including a portion of the Water Pollution Control Facility and a small commercial marina, are zoned WCI, Waterfront Commercial District, as is an area to the north of Hamilton Street, immediately adjacent to the NUWC property.

The purpose of the Waterfront Commercial/Industrial zone is "to encourage water dependent and water related industrial and major commercial use along

appropriate portions of the Thames River waterfront consistent with the objectives of the State Coastal Area Management Program and the New London CAM Plan of Development." Minimum lot area in the Waterfront Commercial/Industrial zone is 10,000 square feet.

A small area to the north of Hamilton Street located immediately to the east of the Amtrak line is zoned Waterfront Development District (WD), including the Miner & Alexander Lumber Company.

Lower Pequot Avenue Area

The area south of Trumbull Street between Pequot Avenue and the railroad tracks is also zoned Waterfront Commercial/Industrial (WCI).

NUWC Area

The area east of Smith Street and East Street extending to the Thames River, including the NUWC facility, is zoned Waterfront Commercial/Industrial (WCI).

2.1.7 Coastal Zone Management

The Fort Trumbull MDP area is located within Connecticut's coastal boundary as defined by Section 22a-94 of the Connecticut General Statues (CGS) and is subject to the provisions of the Connecticut Coastal Management Act (CCMA) (CGS Sections 22a-90 through 22a-112). In accordance with CGS Section 22a-100, state actions and state funded actions within the coastal boundary which may significantly affect the environment must be consistent with the goals and policies of the CCMA.

The coastal boundary is determined as follows: (1) a continuous line on the landward side by the interior contour elevation of the 100-year frequency coastal flood zone, as defined and determined by the National Flood Insurance Act; or (2) a 1,000 foot setback measured from the mean high water mark in coastal waters; or a 1,000 foot linear setback measured from the inland boundary of tidal wetlands mapped under CGS Section 22a-20, whichever is farthest inland. The entire MDP project area is within the coastal boundary.

Coastal waters are defined as those waters of Long Island Sound and its harbors, embayments, tidal rivers, streams and creeks which contain a salinity concentration of at least 500 parts per million (0.5 parts per thousand, ppt) under the low flow stream conditions as established by the Commissioner of the Department of Environmental Protection (CGS Section 22a-93(5)).

The following general goals and policies have been established in CGS Section 22a-92:

(1) to ensure that the development, preservation or use of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water resources to support development, preservation or use without significantly disrupting either the natural environment or sound economic growth;

(2) to preserve and enhance coastal resources in accordance with the policies established by chapters 439 (Environmental Protection Department and State Policy), 440 (Wetlands and Watercourses), 446i (Water Resources), 446k (Water Pollution Control), 447 (State Parks and Forests), 474 (Pollution), and 477 (Flood Control and Beach Erosion);

(3) to give high priority and preference to uses and facilities which are dependent upon proximity to the water or the shorelands immediately adjacent to marine and tidal waters;

(4) to resolve conflicts between competing uses on the shorelands adjacent to marine and tidal waters by giving preference to uses that minimize adverse impacts on natural coastal resources, while providing long-term and stable economic benefits;

(5) to consider in the planning process, the potential impact of coastal flooding and erosion patterns on coastal development so as to minimize damage to and destruction of life and property and reduee the necessity of public expenditure to protect future development from such hazards;

(6) to encourage public access to the waters of Long Island Sound by expansion, development, and effective utilization of state-owned recreational facilities within the coastal area that are consistent with sound resource conservation procedures and constitutionally protected rights of private property owners;

(7) to conduct, sponsor. and assist research in coastal matters to improve the data base upon which coastal land and water use decisions are made;

(8) to coordinate the activities of public agencies to ensure that state expenditures enhance development, while affording maximum protection to natural coastal resources and processes in a manner consistent with the state plan for conservation and development adopted pursuant to part I of Chapter 297;

(9) to coordinate planning and regulatory activities of public agencies at all levels of government to ensure maximum protection of coastal resources, while minimizing conflicts and disruption of economic development; and

(10) to ensure that the state and the coastal municipalities provide adequate planning for facilities and resources which are in the national interest and to ensure that any restrictions or exclusions of such facilities or uses are reasonable. Facilities and resources which are in the national interest include:

(a) adequate protection of tidal wetlands and related estuarine resources;

(b) restoration and enhancement of Connecticut's shellfish industry;

(c) restoration, preservation, and enhancement of the state's recreational and commercial fisheries, including anadromous species;

(d) water pollution control measures and facilities consistent with the requirements of the federal Clean Water Act, as amended;

(e) air pollution control measures and facilities consistent with the requirements of the federal Clean Air Act, as amended;

(f) continued operations of existing federally-funded dredged and maintained navigation channels and basins;

(g) energy facilities serving statewide and interstate markets, including electric generating facilities and facilities for storage, receiving or processing petroleum products and other fuels;

(h) improvements to the existing interstate rail, highway and water-borne transportation system;

(i) provision of adequate state or federally-owned marine related recreational facilities, including natural areas and wildlife sanctuaries; and

(j) essential maintenance and improvement of existing water-dependent military, navigational, resource management, and research facilities.

Reasonable grounds for the restriction or exclusion of a facility or use in the national interest shall include a finding that such a facility or use: (a) may reasonably be sited outside the coastal boundary; (b) fails to meet any applicable federal and state environmental, health or safety standard, or (c) unreasonably restricts physical or visual access to coastal waters.

Adverse impacts on coastal waters, as defined by the CCMA (CGS Section 22a-93(15) and 22a-93(17)), include the following:

- degrading tidal wetlands, beaches and dunes, rocky shorefronts, and bluffs and escarpments through significant alteration of their natural characteristics or functions;
- increasing the hazard of coastal flooding through significant alteration of shoreline configurations or bathymetry, particularly within high velocity flood zones;
- degrading existing circulation patterns of coastal waters through the significant alteration of patterns of tidal exchange or flushing rates, freshwater input, or existing basin characteristics and channel contours;

- degrading natural or existing drainage patterns through the significant alteration of ground water flow and recharge and volume of runoff;
- degrading natural erosion patterns through the significant alteration of littoral transport of sediments in terms of deposition or source reduction;
- degrading visual quality through significant alteration of the natural features of vistas and view points;
- development and activities such as (A) locating a non-water-dependent use at a site that (i) is physically suited for a water-dependent use for which there is a reasonable demand or (ii) has been identified for a water-dependent use in the plan of development of the municipality or the zoning regulations; (B) replacement of a water-dependent use with a non-water-dependent use; and (C) siting of a non-water-dependent use which would substantially reduce or inhibit existing public access to marine or tidal waters;
- degrading water quality through the significant introduction into either coastal waters or ground water supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, pH, dissolved oxygen or salinity; and
- degrading or destroying essential wildlife, finfish or shellfish habitat through significant alteration of the composition, migration patterns, distribution, breeding or other populations characteristic of the natural species or significant alterations of the natural components of the habitat.

As per Section 22a-92(a)(3), highest priority and preference must be given to uses and facilities dependent upon proximity to water or shorelands immediately adjacent to marine and tidal waters. As previously described, the

CCMA also requires the minimization of adverse impacts on future water-dependent development opportunities and activities (CGS Section 22a-93(17)).

As per the CCMA, the management of estuarine embayments with respect to coastal uses must sustain biological productivity and maintain healthy marine populations. Section 22a-93(7)(G) defines estuarine embayment as a protected coastal body of water with an open connection to the sea in which saline seawater is measurably diluted by freshwater, including tidal rivers, bays, lagoons and coves. The Fort Trumbull area is surrounded by waters that are characterized as an estuarine embayment pursuant to the CCMA definition.

Other pertinent sections of the CCMA are discussed in Section 2.9 (Water Resources, Section 2.10 (Flood Hazard Potential), and Section 2.11 (Biological Environment) as it pertains to these resources.

2.2 Socioeconomics

The following information regarding demographics, employment, and tax base has been obtained in part from the City of New London Plan of Development, regional documents. Census information and statistics, as well as data obtained from the New London Assessor's Office and field investigations. This discussion is intended to provide an overall background of the demographic make-up of the City of New London and the project area. Some of this information is referenced in the discussion of potential impacts in Section 4.0 of this document.

The population in New London has been declining since 1960 and has not been lower since the 1930's. Unemployment in the city, at 7.6%, is considerably

higher than the statewide rate of 4.0% and is higher than the closest urban municipalities of Groton (4.7%) and Norwich (6.3%). Tax revenues in the MDP area are quite low at $324,926, considering it comprises an area of approximately 90 acres. A more detailed discussion of demographics, employment, and tax revenues follows.

2.2.1 Demographics

New London has been affected by the dramatic growth in population in the surrounding suburban and rural towns. Growth in New London stabilized in 1960 and since then, the city has been experiencing a decline. Since 1980, specific demographic changes have also occurred to the City of New London's residential population.

Between the years 1900 and 1960, the city's population nearly doubled from 17,548 persons to 34,182 persons, an increase of 95%. However, following the peak in 1960, population decreased by 16.5% to its 1990 level of 28,540 persons. Table 2.2-1 summarizes the growth and decline of the population of New London based on U.S. Census data.

The estimated 1998 population in New London, Connecticut is 23,860 based on data published by Claritas, Inc. This represents a decline of almost 5,000 persons in eight years. The population has not been this low since prior to 1920. Connecticut DECD population estimates are somewhat higher, with an estimated 1995 population of 26,920.

TABLE 2.2-1
New London Historic Population
(1900-1990)*

Year	Population	% Change	Year	Population	% Change
1900	17,548	---	1950	30,551	+ 0.3%
1910	19,659	+ 12.0%	1960	34,182	+ 11.9%
1920	25,688	+ 30.7%	1970	31,630	- 8.1%
1930	26,640	+ 3.7%	1980	28,842	- 8.8%
1940	30,456	+ 14.3%	1990	28,540	- 1.0%

*Source: U.S. Census

The city's declining population figures can be partially attributed to a series of changes to the demographic makeup that have occurred in the past few decades. Some of the changes include a declining number of families residing in the city, a decline in the size of the typical household, an increase in the number of householders living alone or in non-family households, as well as a decline in the birth rate. The population pattern is also affected by the World War II and Cold War expansion, and in later years, contraction of activities of the U.S. Naval submarine base in Groton and at Electric Boat.

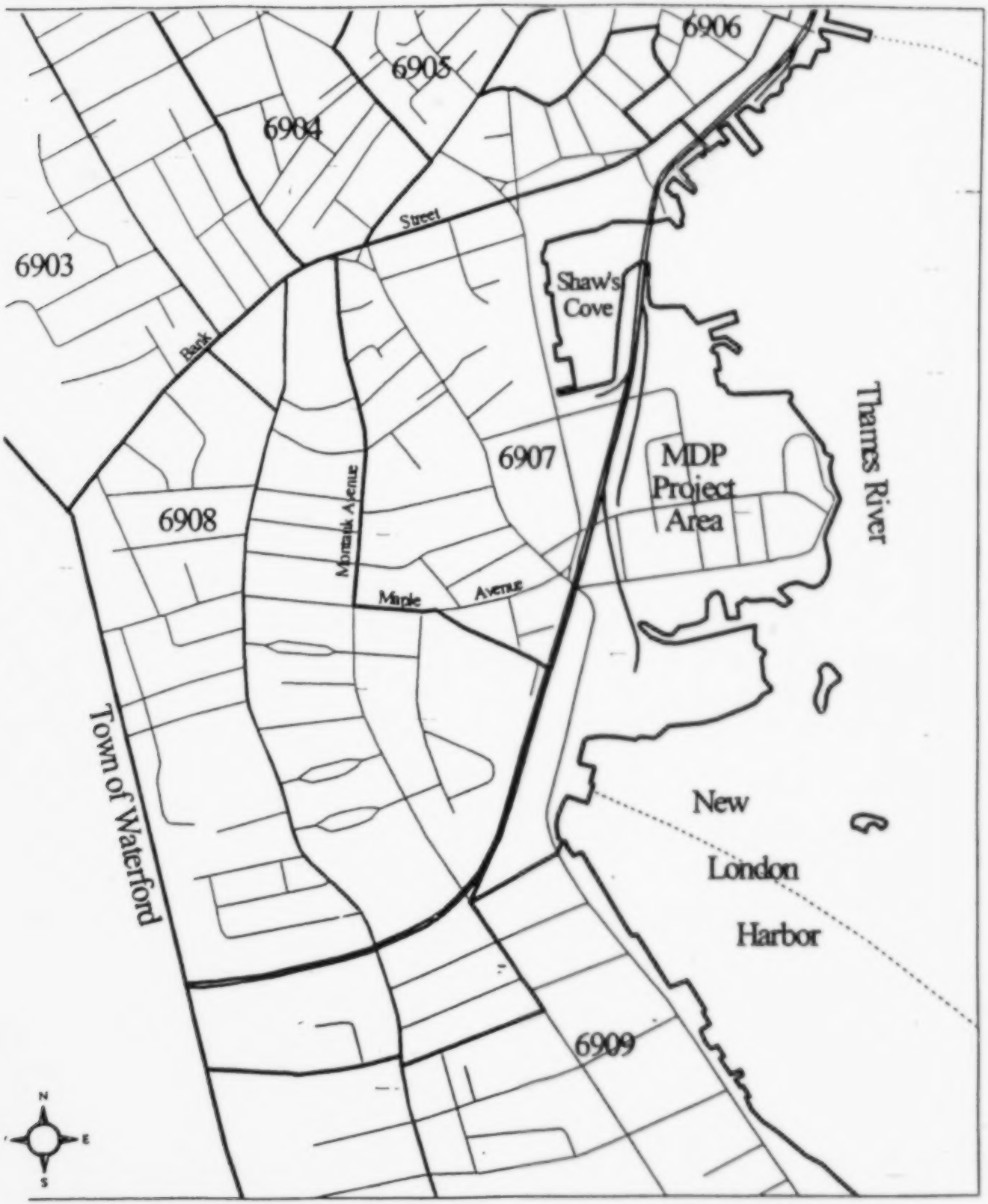
Table 2.2-2 presents 1998 estimated population as compared to 1990 Census data based upon information published by Claritas, Inc. The Connecticut Office of Policy and Management projects that the decline in the city's population will slow over the next five years and is expected to stabilize by the year 2000 and then begin to increase. The sharp decline in population and families residing in New London demonstrates the need for revitalization in this community.

TABLE 2.2-2
1998 Estimated New London
Population – Claritas, Inc.

Universe	1990 Census	1998 (est.)	% Change (1990-98)
Population	28,540	23,860	-16.4
Households	10,712	9,271	-13.5
Families	6,007	5,047	-16.0
Housing Units	11,970	10,698	-10.6
Household Size	2.29	2.26	-1.3

Source: Claritas, Inc., June 18, 1998.

The Fort Trumbull area is generally comprised of Census Tract 6907. Figure 2.2-1 shows the extent of Census Tract 6907. Table 2.2-3 presents demographic and socio-economic characteristics of this Census Tract in comparison to the city at large. As these figures demonstrate, demographics of the Fort Trumbull area is similar to that of the City of New London as a whole.



...mbull MDP Area - New London, Connecticut
...t Environmental Impact Evaluation - November 1998

...e: GIS coverages developed by Milone & MacBroom, and HMA, Inc. Sources include Connecticut DEP, ... y of New London, FEMA, and US Navy. Intended for planning y - not for design use.

Figure 2.2-1
1990 Census Tracts
— New London, Connecticut

1000 0 1000 2000

TABLE 2.2-3
Demographic and Socio-Economic Characteristics
City of New London and Fort Trumbull Study Area

	City of New London	Tract 6907
Population	28,540	1,449
Households	10,715	565
% Racial Minority	27.2	31.5
% Hispanic origin	12.1	11.6
Housing Units	11,970	656
Renter-Occupied Housing Units (%)	63.1%	61.4%
Owner-Occupied Housing Units (%)	36.9%	38.6%
Median Year Structure Built	1939	1939
Length of Residency Over 30 Years (%)	10.4%	12.2%
Median Household Income	$26,336	$28,750
Median Family Income	$31,274	$29,911
Per Capita income	$12,971	$12,598
% Low/Moderate Income Persons	55.02%	56.88%

Source: 1990 Census STF 1A and STF-3A; U.S. Department of Housing and Urban Development

2.2.2 Employment

The following discussion provides a baseline of existing employment in the City of New London and in the MDP project area. This baseline is evaluated further in Section 4.0 of this document, with respect to projected impacts on employment of the six project alternatives.

Citywide Employment

The economy of the City of New London has been adapted and readjusted to the changing forces of technology and the effects of national and international events that have shaped the nature of businesses and industries that comprised the city's

economic base. The city's economy has evolved through several distinct periods. Initially established as an agricultural plantation (1645), it grew into a significant merchant shipping and fishing/whaling port (1718-1871) before becoming a manufacturing community (1827-1920) and, most recently, a retail and service center. Throughout all of these periods, the city has been able to rebound and to retain a measure of its economic vitality.

Over the past 20 years (1970 to 1990), the city's economy has not grown as substantially as the regional and state economy. The regional labor market experienced a higher growth rate (45%) in employment than either the city (17%) or the state (40%) in the same time period, although the city did expand its employment base by 2,770 jobs. Its slower rate of growth resulted in its share of the total employment in the regional labor market to decline from about 21% in 1970 to less than 17% in 1989.

The unemployment rate as estimated for New London residents in 1998 by the Connecticut Department of Labor was 7.6%. This figure has remained relatively stable since 1990. This is somewhat higher than the unemployment rate for the State of Connecticut, which was 5.2% in 1990 and rests at 4.0% in 1998.

Table 2.2-4 illustrates employment trends by place of work in the city.

TABLE 2.2-4
Employment Trends by Place of Work
for the City of New London
(Residents and Non-Residents) 1990-1997

Industry	1990	1997	Change	% Change
Construction	430	180	-250	-58
Manufacturing	950	730	-220	-23
Transportation, Comm., Utilities	N/A	1,220	---	---
Wholesale Trade	500	410	-90	-18
Retail Trade	2,730	2,780	+50	+2
Finance, Insurance, Real Estate	850	450	-400	-47
Other Services	7,300	7,870	+570	+7
Government	4,300,	2,950	-1,350	-31
TOTALS:	**17,060**	**16,590**	**-1,690**	**-3%**

Construction experienced the largest decrease in numbers from 430 in 1990 to 180 in 1997, illustrating a 58% decrease. A considerable decrease (47%) in employment was also experienced by the finance, insurance, and real estate brackets from 850 in 1990 to 450 in 1997. Overall total employment dropped by 3%.

Existing Employment Base Within the MDP Area

At the present time, there are approximately 28 businesses located within the MDP area. It is estimated that these businesses employ between 148 and 222 people in total, as outlined in Table 2.2-5.

Of the 28 businesses in the study area, only seven employ more than 10 people. Amtrak is the largest employer, with estimated employment of 40 to 60 people. No other employer in the study area employs more than 20 people.

TABLE 2.2-5
Businesses in the MDP Area (October 1998)

Business	Location	Estimated Range	
Gateway Area		**Low**	**High**
Miner and Alexander	150 Howard St.	10	16
Hawthhorne Woodworking	162 Hamilton St	2	3
Leger Electric	162 Hamilton St.	6	10
County Contractor	169 Howard St.	4	8
Acct/Lawyer Firms (3)	194 Howard St.	12	20
Integrated System	210 Howard St.	3	5
Islamic Center	216 Howard St.	1	1
Leo's Service Station	175 Howard St.	2	3
Halfway House	189 Howard St.	3	5
Hughie's Restaurant	221 Howard St.	10	12
Conn. Comm. RE	229 Howard St.	3	5
Kevin's Corner (Thames Refinisher)	Harris St.	0	0
	Subtotal	56	88
Fort Area		**Low**	**High**
Fort Trumbull Marina	93 Trumbull St.	2	3
Private Lobstermen		2	3
Optican	95 Trumbull St.	2	3
NL Trap & Bait	82 Trumbull St.	3	5
Byron's Auto	72 Smith St.	2	3
Iglesia Primaria Church	68 Smith St.	1	1
Comm. Fishing Fleet	37 Smith St.	12	18
Processing Facility	37 Smith St.	3	5
Sonalysts, Inc. (Currently Vacant)	72 Goshen St.	2	5
Fort Trumbull Cafe	36 Walbach St.	3	5
Amtrak Staging Area	Walbach St.	40	60
Caretaker/Security [1]	NUWC	11	14
	Subtotal	83	125

Lower Pequot Avenue		**Low**	**High**
Acton Sheet Metal	21 Pequot Ave.	3	3
Letter Company	21 Pequot Ave.	2	2
Thames Refinisher	21 Pequot Ave.	4	4
	Subtotal	9	9
	Study Area Total	**148**	**222**

[1] Currently, a 14-person staff that will be reduced to 11 persons in September, 1998.

2.2.3 Existing Tax Revenues

According to information provided by the New London Assessor's Office, properties in the MDP area have a total assessed valuation of $13.1 million, which includes several tax-exempt properties. This figure includes $4.2 million in land and an additional $8.9 million in buildings. Table 2.2-6 provides a summary of the taxable valuation of properties in the study area, by geographic area.

As shown in Table 2.2-6, the properties in the study area generate $357,929 in property tax revenue at full taxation. Excluding exempt and city-owned properties, a total of $324,926 is generated each year in real property taxes.

For purposes of this analysis, it is assumed that the underlying land values will reflect existing conditions, and that any new construction in the study area will be assessed at 70% of construction cost, based on assessment practices in Connecticut. No timing or phasing of revenues has been included, and all financial figures are stated in 1998 dollars.

TABLE 2.2-6
Taxable Valuation of Study Area Properties

	Acres	Gross Bldg. SF	Land Asmt. (000)	Bldg. Asmt. (000)	Total Asmt. (000)	Real Estate Taxes [1]
NUWC-PS [2]	14.7	555,185	N/A	N/A	N/A	$0
Gateway	12.4	236,874	$1,634.03	$5,316.42	$6,950.45	$189,747
Fort Trumbull [3]	14.4	215,169	$2,461.83	$3,323.11	$5,784.94	$157,929
Lower Pequot [4]	0.9	28,218	$121.10	$254.45	$375.55	$10,253
Subtotal	42.5	1,035,446	$4,216.96	$8,893.98	$13,110.94	$357,929
GW Exempt [5]	2.9	20,779	$179.83	$299.74	$479.57	($13,092)
FT Exempt [6]	2.8	13,440	$561.54	$167.79	$729.33	($19,911)
Subtotal	5.7	34,219	$741.37	$467.53	$1,208.90	($33,003)
Net Total	**36.8**	**1,001,227**	**$3,475.59**	**$8,426.45**	**$11,902.04**	**$324,926**

Source: City of New London Assessment Division and RKG Associates, Inc.

[1] Based on a mil rate of $27.30.

[2] That portion slated for public sale and/or, maritime conveyance.

[3] Does not include wastewater treatment facility and adjacent city-owned land.

[4] Reflects properties #5 through 21 Pequot Avenue.

[5] Exempt properties in the Gateway include eight city-owned parcels.

[6] Exempt properties in the Fort Area include one church and five railroad parcels (or portions thereof).

2.3 Neighborhood/Housing

The potential for neighborhood relocation was identified in the Environmental Assessment for this project, as a significant issue requiring analysis in the CEPA process. The following discussion is presented as a basis for impact analysis of potential displaced residents and businesses associated with the identified land use alternatives.

2.3.1 Citywide Housing

Over the past several decades, the City of New London's housing stock has been affected by a series of demographic and development trends. These trends have affected the ability of the community to respond to the maintenance, enhancement, supply and demand for the city's housing stock.

The 1990 Census statistics reveal that the composition of the housing supply has changed. The number of single-family housing units was 4,109, or 36% of all city housing units in 1980. The 1990 figures show a decrease of approximately 5% to 3,751, or 31.3% of the total housing units in the city. Table 2.3-1 illustrates the differences in housing stock between 1980 and 1990.

TABLE 2.3-1
Composition of the New London Housing Stock
1980 – 1990

Type	1980	Percent	1990	Percent
Single-Family Unit	4,109	36.0%	3,751	31.3%
2 – 4 Family Unit	3,440	30.1%	3,897	32.6%
5 – 9 Family Unit	1,165	10.2%	1,326	11.1%
10+ Family Unit	2,691	23.6%	2,797	23.4%
Other			199	1.7%
TOTALS:	**11,405**		**11,970**	

Source: U.S. Census, 1980 and 1990

Today, the single-family dwelling is not the dominant form, and the percentage of single-family units in the housing stock is dramatically lower than all other municipalities in the region, including Norwich, and is lower than several of the larger urban communities in the state, including Stamford, Meriden, Middletown, Waterbury, and New Britain. Consequently, the percentage of multi-family dwelling units (2+ family units) is correspondingly high and has increased by over 12% from 7,296 in 1980 to 8,219 units in 1990. At the present time, 67% of all housing units in the city are classified as multi-family dwellings.

The majority of the city's residents tend to rent the housing that they live in. The total number of housing units that were renter-occupied in 1990 was 6,758 units or 63.1%, whereas only 3,954 or 36.9% of the units were owner-occupied. By comparison, a total of 5,719 housing units, 58.6% of all occupied housing units, were renter-occupied in 1970. Statistically, the trend towards the increasing numbers of renter-occupied units highlights the disproportionate imbalance between owner versus renter-occupied units.

These figures identify the need to develop strategies and programs to allow opportunities for more residents to attain home ownership, thereby improving the balance in the housing stock.

According to the 1990 U.S. Census, 7,300 (61%) of the total housing units in the City of New London were built prior to 1950. Only 15% of the city's existing housing stock has been constructed since 1970. It is expected that the majority of these buildings are structurally sound, although their age warrants the need for increasing levels of maintenance, rehabilitation, and modernization.

The overall condition of housing stock with respect to code compliance is not known at this time as this would, in many cases, require inspection of residential dwelling interiors which are not currently accessible. At least two buildings in the project area have been condemned by the city. Additional information concerning the condition of buildings within the project area is provided in Section 2.3.3 of this document. Table 2.3-2 presents the age of the New London housing stock as of 1990.

TABLE 2.3-2
Age of New London Housing Stock

Year Built	Percent	Number
1939 or earlier	52.9%	6,336
1940 to 1949	8.1%	964
1950 to 1959	10.7%	1,279
1960 to 1969	13.0%	1,553
1970 to 1979	11.7%	1,406
1980 to 1990	3.6%	432
TOTALS:	**100.0%**	**11,970**

Source: U.S. Census, 1990

New London has little vacant land available for new residential development. A recent land use survey conducted by city staff revealed that only 258.61 acres (7.1%) of the total land area of the city (3,652.78 acres) are vacant and residentially zoned. A good portion of this vacant land has serious limitations for development. Consequently, very few new housing units were built during the 1980's in the city as compared to other communities in the region. During the period of 1980 to 1989, the City of New London experienced only a 2.5% increase in construction of new housing units as reported by the Southeastern Connecticut Regional Planning Agency in June of 1990. The regional average was 14.7%, and Colchester experienced the largest increase at 50%. Table 2.3-3 illustrates the increase in housing units for New London and selected surrounding towns.

TABLE 2.3-3
Estimated Increase in Housing Units for New London and Selected Surrounding Towns – 1980 to 1989

Town	Percent	Total Units
New London	2.5%	289
Sprague	9.0%	95
Norwich	9.7%	1,482
Waterford	15.8%	1,017
Groton	19.7%	2,749
Salem	39.8%	356
Colchester	50.8%	1,404

Source: Southeastern Connecticut Regional Planning Agency

Since 1980, the number of vacant housing units has increased significantly in the City of New London, from a total of 950 vacant units to 1,258 units (+32%) in 1990. This increase equates to a vacancy rate of 10.5%, which can be further broken down at a rate of

2.3% for homeowners and 10.4% for renters. Excluding the 121 seasonal housing units, the vacancy factor of year-round housing units was 9.5%, as indicated in the 1990 Census.

More recent vacancy data is not available; however, anecdotal evidence from real estate professionals indicates vacancy at the newer, modernized apartments has declined from levels reported in the 1990 Census. However, there still remains an unknown number of dwelling units considered "unmarketable/uninhabitable" throughout New London, including the project area.

2.3.2 Residential Analysis

Overview

The New London Plan of Conservation and Development reports that, despite its relatively compact size, New London offers a wide diversity of housing opportunities for its residents. The city contains a significant inventory of housing stock which varies in size and price and includes: spacious, well maintained historic mansions; single family homes; duplexes; townhouses; condominiums; apartment complexes; rooming and boarding houses; apartment hotels; group homes; and high density, high rise public housing. The City contains some of the most affordable housing in the State.

Table 2.3-4 presents statistics available from the 1990 Census of Population and Housing. It provides summary information on the number, availability, and cost of owner-occupied and rental housing units in New London and the neighboring municipalities of Groton and Waterford. As appropriate, data from the City of New London's Consolidated Plan for Housing and Community Development and Plan of Conservation and Development has also been included in this analysis.

TABLE 2.3-4
Comparative Census Statistics –
New London and Adjacent Communities

	New London	Waterford	Groton
Total Number of Housing Units	11,970	7,357	16,598
Occupied Units	10,712	6,956	14,853
Vacant Units	1,258	401	1,745
% Vacant	10.5	5.4	10.5
Owner Occupied Units	3,954	5,878	7,048
% Owner Occupied	36.9	84.5	47.5
Renter Occupied Units	6,758	1,078	7,805
% Renter Occupied	63.1	15.5	52.5
Overall Vacancy Rate	10.5	5.4	10.5
Vacancy Rate for Owner Occupied	2.3	1.5	4.6
Vacancy Rate for Renter Occupied	10.4	5.4	7.9
Median Value	$131,600	$159,700	$148,200
Median Contract Rent	$455	$570	$547

Source: 1990 U.S. Census

Ownership

As evidenced by the data presented in Table 2.3-4, the majority of the city's residents rent housing (63.1% of the housing units are renter-occupied). Over the past several census periods the percent of renter-occupied housing be [illegible] eased. In 1970, 58.6% of all occupied housing units were renter-occupied, increasing to 62.5% in 1980. As outlined in the city's Plan of Conservation and Development, this trend of increasing number of renter-occupied units highlights the current imbalance between owner and renter housing.

According to the Plan, these figures identify the "need to develop strategies and programs to allow opportunities for more residents to attain home ownership, thereby improving the balance in the housing stock."

Home Ownership

At the time of the 1990 Census, 31.3% (3,751) of the city's housing stock was comprised of single-family units. This percentage is comparatively lower than all of the other municipalities in the New London region. Single-family homes comprised 56.5% of Groton's housing stock and 57.4% of Waterford's housing stock. Of the 3,751 single-family housing units in New London, 3,387 were single-family detached units and 364 were single-family attached (generally condominium-type units). Table 2.3-5 depicts the housing units by structure type based on the 1990 Census. The number of 2- to 4-unit structures in New London provides the opportunity to combine home ownership with rental income availability. This configuration, where the homeowner can offset costs with rental income from tenants in other units within the structure, is a common configuration for affordable housing programs.

TABLE 2.3-5
Housing Units by Structure Type

Units in Structure	New London	Waterford	Groton
1-Unit, Detached	3,387	6,359	7,509
1-Unit, Attached	364	148	2,012
2 to 4 Units	3,897	414	2,755
5 to 9 Units	1,326	150	1,146
10 or More Units	2,797	73	2,215
Mobile Home, Trailer, Other	199	213	961
Total	**11,970**	**7,357**	**16,598**

Source: 1990 U.S. Census

As a means to reverse the declining trend in home ownership in the city and to ensure long-term housing affordability, New London has established a program whereby deteriorating properties are purchased and rehabilitated and then sold to low- and moderate- income families. Property deeds contain resale restrictions on the price or give the right of first refusal to the city or a trust, which in turn would sell it to another low-moderate income family.

In 1993, the City initiated a purchase and rehabilitation program which has resulted in the reconstruction of several homes. As of October 1998, four homes (3 single-family and 1 duplex) were available through the New London Neighborhood Investment Initiative Program. These homes are being sold for between $62,000 and $80,000. Homes are sold to income-qualified owners (80% of New London Area Median Income) in move-in condition. They have been renovated to meet housing and building code standards as well as local lead-safe standards. Three additional properties were underway as part of the Neighborhood Investment Initiative Program. All three of these units contain at least one rental unit.

In addition to the city's Neighborhood Investment Initiative Program, which provides affordable home ownership opportunities, a special home ownership assistance program is also being offered to households being displaced by municipal development programs through the Connecticut Housing Finance Authority (CHFA). CHFA provides Home buyer mortgages, downpayment assistance and/or rehabilitation mortgage loans to income-eligible households. A special ¼% fee reduction is available for program participants from/or in New London.

Availability of Rental Housing

At the time of the 1990 Census, 2,797 housing units were located in structures containing 10 or more housing units. A 1996 inventory of multi-family housing (i.e. those developments containing 10 or more units) was undertaken as part of the Plan of Conservation and Development process. This inventory is included in Appendix B. The majority of the multi-family housing in the city was built during the 1960's and 1970's. Of the 3,748 units in the 1996 inventory, 1,633 (44%) were publicly subsidized in some manner and the remaining were private market units.

In addition to the rental opportunities in large multi-family developments, New London also has a significant amount of rental housing units in buildings with two to four units (3,897 units) and a lesser amount in buildings of five to nine units (1,326 units).

In an attempt to quantify the availability and cost of rental housing in New London and its adjacent communities of Groton and Waterford, the Real Estate Guide published by the *New London Day* was reviewed for a four week period from September 11, 1998 through October 2, 1998. The review of the rental listings is summarized in Appendix B.

According to the real estate listings, the average cost for a one bedroom apartment in New London was just over $500. One bedroom units in Groton averaged $552. Only a limited amount of apartments were listed in Waterford. Of those listed, rents ranged between $500 to $600 for a one-bedroom apartment. Rents for two-bedroom units averaged $589 in New London and $629 in Groton. Rents for two-bedroom units in Waterford ranged between $600 and $700. Based upon the sample analyzed, rents in Groton

were typically $50 more per month than New London rents for similar sized units.

In an average weekly listing, between 15 and 20 one-bedroom units were listed for rent; 10 to 15 two-bedroom units were listed; 5 three-bedroom units were listed; and 5 studio/efficiency units were listed for rent in New London. In addition, the larger apartment complexes in the area advertised unit availability without providing unit characteristics.

The U.S. Department of Housing and Urban Development published the 40th percentile fair market rents for existing housing based upon survey data. The monthly fair market rents for the New London-Norwich area as of October 1, 1998 were $491 for an efficiency unit; $594 for a one-bedroom; $723 for a two-bedroom; $905 for a three-bedroom; and $1,034 for a four-bedroom. These rents include utilities.

Availability of Ownership Housing

Since 1990, the City of New London has experienced very little new housing construction. In fact, over the past several years, demolition of substandard and deteriorated properties has offset any true net gains in dwelling units. Due to the lack of developable land for residential purposes in the city, the majority of new housing units brought to the market have been renovated units in existing structures.

Table 2.3-6 presents authorized new housing construction in New London, Waterford, and Groton from 1990 to 1997.

TABLE 2.3-6
Housing Units Authorized (New Construction)
1990 to 1997

Location	1990	1991	1992	1993	1994	1995	1996	1997
New London	16	5	11	3	1	2	0	0
Waterford	37	42	42	58	110	89	157	79
Groton	52	46	121	59	71	40	74	82

As of mid-August 1998, according to the southeastern Connecticut Board of Realtors Multiple Listing Service, 105 residential properties were sold in New London at an average selling price of $102,100. Over the same eight month period, 180 homes were sold in Waterford and 234 homes were sold in Groton.

Average [illegible] prices in Waterford and Groton were slightly higher than New London's sale prices, at $142,000 and $159,900 respectively.

Recent residential sales data (as provided by Commercial Record) for New London, Groton, Waterford and all of New London County are shown in Table 2.3-7. Over the past five years, New London averaged 275 sales per year with median sales prices in the $75,000 to $80,000 range.

TABLE 2.3-7
Residential Sales Data (1993 to 1997)

	1993	1994	1995	1996	1997
New London					
# of Sales	209	253	298	286	346
Median Sales Price	$80,000	$75,000	$80,000	$82,000	$74,000
Waterford					
# of Sales	291	320	323	365	404
Median Sales Price	$115,000	$109,900	$109,900	$112,500	$111,100
Groton					
# of Sales	380	458	489	490	531
Median Sales Price	$112,000	$107,000	$108,000	$109,000	$116,500
New London County					
# of Sales	3,438	3,951	3,935	3,983	4,494
Median Sales Price	$109,000	$109,000	$105,000	$105,000	$110,000

Source: Commercial Record

As of September 1998, New London had 106 active residential listings. Waterford had 154 and Groton had 220. Average list prices for the three communities are $104,000, $168,100, and $194,000 respectively. A review of published real estate listings in New London showed 19 homes for sale under $70,000 and 23 homes for sale between $70,000 and $90,000. A summarized listing of homes for sale in New London at the time of this report is included in Appendix B.

City of New London Housing Goals and Policies

Within both the city's Plan of Conservation and Development and Consolidated Plan for Housing and Community Development, several common themes for future housing goals were voiced. These themes included: improving the existing housing stock through rehabilitation, conservation, and code enforcement. providing more opportunities for home ownership, decreasing the burden on New London taxpayers by seeking a more regional approach to the provision of affordable housing, and providing a more balanced housing supply within the city in terms of cost, type, and ownership.

The overall housing goal for the city, as included in its 1997 Plan of Conservation and Development reads as follows:

> Enhance the city's position as a fine residential community by improving the quality of the city's neighborhoods, providing more opportunities for home ownership, improving the condition of the housing stock, and decreasing the burden on New London's tax payers, while assuring the provision of a quality housing supply that reflects a more balanced distribution of costs, types, sizes, locations, ownership, and supply throughout the city and the region to meet the changing needs of all segments of the city's population.

Compared to other communities in the region and the state, the City of New London contains a disproportionate percentage of publicly-assisted housing as well as rental housing. According to statistics maintained by the State of Connecticut Department of Economic and Community Development, as they relate to the Affordable Housing Appeals Procedure, 18.62% of New London's housing stock is affordable as defined by Connecticut General Statute 8-39a.

2.3.3 Building Inventory of the MDP Area

The MDP area has a diverse inventory of 117 buildings containing approximately 1.04 million square feet of space. The development area at NUWC (which excludes the planned state park and areas to remain with the U.S. Coast Guard and the Navy) is densely developed and is improved with 19 buildings containing nearly 555,200 square feet or 53% of the building area in the Fort Trumbull MDP area. The Gateway Area has 23% of the building inventory, followed by the Fort Area with 21%. The Lower Pequot Avenue Area contains the remaining 3% of the building space.

NUWC

Considering that the primary mission at NUWC was research and development (R&D), it is not surprising that nearly 79% of the buildings in the development portion of NUWC were utilized for office and/or R&D purposes. Another 11% of the space was utilized for shop and/or warehouse purposes, followed by 10% for recreational, utility and miscellaneous purposes. All buildings within the development portion of NUWC are considered vacant at this time.

Gateway Area

The Gateway Area contains 236,900 square feet in 38 buildings, including 168,600 square feet in 19 non-residential buildings. The residential component consists of 34 dwelling units in 19 buildings (68,300 square feet). It is estimated that 10 units are currently vacant, indicating an occupancy rate of 71%. More than 88,200 square feet of non-residential building space are vacant, resulting in an occupancy rate of 48%. Warehouse use is the most prominent commercial use, followed by office use. To a smaller extent, retail and restaurant uses are also present in this area.

Fort Area

The Fort Area contains 57 buildings with 215,200 square feet. Non-residential structures represent 79,800 square feet in this portion of the study area. Residential is the most prevalent use in this district as evidenced by the 135,400 square feet of gross building area in 43 buildings. In total there are 80 dwelling units in this district and 10 are estimated to be vacant, indicating an occupancy rate of 87%. Older multi-level mill buildings are the predominate commercial use, followed by office use, warehouse/shop use, retail/restaurant and other uses. An estimated 30,900 square feet of non-residential building space are vacant, indicating an occupancy rate of 61%. This high vacancy in the Gateway and Fort Area is caused in part by the structural design, age and condition of most of the buildings, which appear inefficient (physically and financially) to support any long-term reuse potential.

Lower Pequot Avenue Area

The Lower Pequot Avenue Area is improved with three buildings, totaling 28,200 square feet, with 21,150 square feet contained in one non-residential building. There are two residential buildings, containing four units, totaling 7,100 square feet in gross building area. One of these residential buildings has been condemned and one of the units in the second building is considered an illegal apartment.

Age and Condition of Building Stock

Fifty-five percent of the building stock in the MDP area is pre-1950 construction, while only 15% of the building inventory is post-1980 construction. All residential properties were constructed prior to 1940; in fact, most were built between 1890 and 1910. Since 1940, most of the building activity in the MDP area

has occurred at NUWC. Building 2 (1990) at NUWC and 194 Howard Street (1985) in the Gateway Area are the most recent major buildings constructed in the area.

Given the age of the building stock, it is not surprising that 41% (427,200 square feet) is wood framed construction (Class D), and another 18% (185,000 square feet) is wood and masonry framed construction (Class C). There are 423,200 square feet (41%) of masonry/steel construction (Class B or A). reflective of more modern construction techniques. This group includes Buildings 2, 80 and 96 at NUWC, as well as the 194 Howard Street office building.

More than 541,400 square feet of the non-residential building area (66%) is in fair to poor condition. This includes Building 80 as well as the other older, wood framed buildings at NUWC. In addition, almost all of the older warehouse and mill buildings in the other districts are in similar condition. In general, these buildings exhibit a high amount of functional obsolescence, and the cost to improve these structures significantly exceeds their economic viability. On the other hand, nearly 283,300 square feet of non-residential building area (34%) is in average or good condition.

Less than 12% of residential buildings, interspersed throughout the different districts, are considered in average or better condition. Approximately 122,300 square feet of residential properties are considered in fair condition, representing 58% of the residential inventory. The remaining 63,800 square feet (30%) are in poor condition. These properties are similarly scattered throughout the MPD area contributing to a saw-tooth visual impression in the various blocks.

Since 1990, the existing buildings have undergone minimal private investment. In fact, portions of the MDP area appear to have suffered more from disinvestment and owners' neglect than improvements or upgrades. Slightly more than $925,000 in improvement costs, based on assessor's information, has been invested since 1990, and more than 60% of this amount has been for improvements to 14 non-residential buildings. Total improvement costs over these eight years, when compared to current assessments, equate to only 6% of total value. This indicates an average improvement cost of less than 1% of assessment per year, suggesting that many properties suffer from deferred maintenance.

Seven buildings in the future development portion of NUWC (i.e., non-state park area, including Buildings 14, 41, 34, 44, 43, 80 and 96), totaling 407,300 square feet, are located within a proposed historic district. This equates to 74% of the building inventory in the development portion of NUWC. Nearly all these buildings (except Building 96) are in fair to poor condition and appear inefficient, either physically or financially, to support long-term reuse potential.

Only two buildings, containing 141,400 square feet, are ranked high in terms of their long-term market potential as office buildings. This represents nearly 14% of the MDP area inventory. In addition, 13 non-residential buildings, containing 150,800 square feet, are considered to have possible interim and/or medium development market potential, that may complement the proposed reuses for the area. Most of these interim properties, equating to nearly 15% of the inventory, are currently occupied. Alternatively, some, or all, of these buildings could be demolished and their sites assembled for other uses, if retaining them over the long term is not feasible and/or their

redevelopment conflicted with other reuse alternatives. Most, if not all, these buildings would require significant investment to continue and/or upgrade their uses.

It should be noted that the three buildings (Buildings 2, 96 and 99) at NUWC with medium to high reuse potential will require exterior changes, internal fit-up, and mechanical upgrades which may trigger additional costs to flood-proof these buildings, given the grandfathered location within the 100-year floodplain. This could effectively diminish their reuse potential.

The remaining 102 buildings totaling 743,250 square feet (72% of the building inventory) have limited, if any, long-term market potential. This group includes the remaining non-residential buildings and all residential properties. Most of these buildings are in relatively poor condition, vary in architectural style and materials, and exhibit a high amount of functional obsolescence. Because their reuse would require financial investment for modernization, demolition may be considered for these structures. The reuse of these existing buildings may not complement redevelopment opportunities in the MDP area.

Vacancy of Building Stock

An estimated 674,300 square feet of non-residential buildings are vacant (including NUWC), indicating a vacancy rate of 82%. There are also 118 residential dwelling units in the MDP area (including two which have been condemned and one which is an illegal apartment). It is estimated that 24 of the residential units are vacant, indicating a vacancy factor of 20%.

2.3.4 Relocation Plan and Process

In July of 1998, the *Relocation Plan for the Fort Trumbull Area Municipal Development Project* was

developed in conjunction with this project. The Plan conforms with the Uniform Relocation Assistance Act (URAA). Since that time, NLDC has been acquiring properties and relocating individuals and businesses in the MDP area on a voluntary basis.

Future acquisition and relocation, if determined to be necessary, will be undertaken to ensure the availability of resources to accommodate displacees. This careful management of the redevelopment process will ensure availability of resources to accommodate displacees. The relocation process will be accomplished by the New London Development Corporation with assistance from others as appropriate. The relocation of site occupants will comply with the Uniform Relocation Assistance Act (Chapter 135 Connecticut General Statutes), the *Relocation Location Plan for the Fort Trumbull Area Municipal Development Project* (July 1988), and local procedures.

In addition to relocation assistance under the URAA, $10 million of Connecticut Housing Finance Authority (CHFA) low rate financing loans will be available to help residents that may be dislocated during or following any proposed redevelopment. The funds will be offered at a rate which is 25 percent lower than CHFA's usual rate in first mortgage financing and can be used by renters and owners to purchase and rehabilitate homes. An additional $250,000 will be available in downpayment assistance for relocated homeowners. The Small Business Assistance Program will also be available, with $250,000 to help small businesses which may be displaced. A detailed discussion of relocation assistance is presented in Section 5.4 of this document.

2.3.5 Residential Households, Businesses, and Non-Profit Agencies

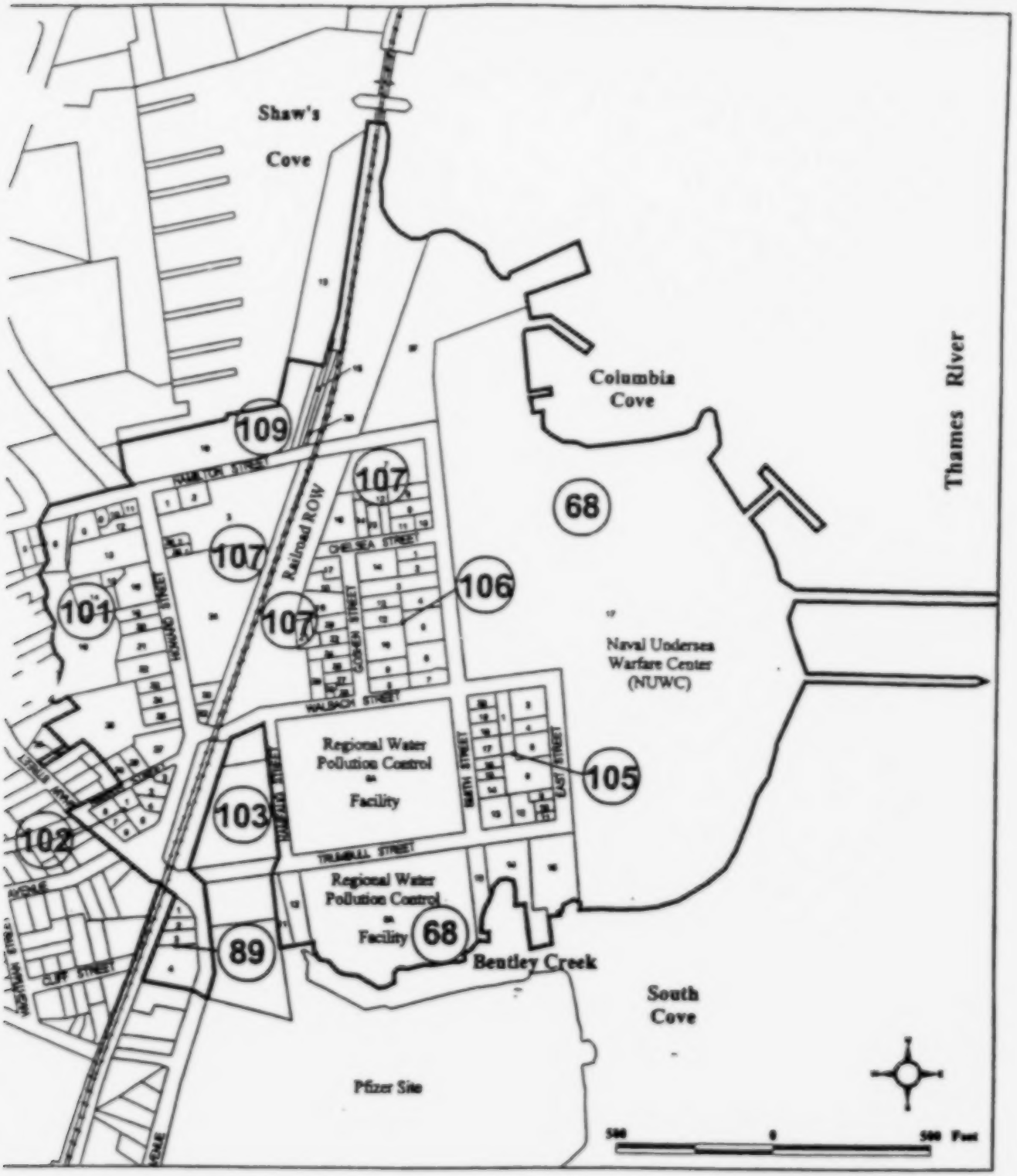
The planning process for creation of a Municipal Development Plan for the Fort Trumbull area has not

been concluded. This is anticipated to be accomplished through the latter part of 1998 and conclude in early 1999. As part of the MDP, a determination will be made of necessary acquisition and relocation of residential households, businesses, and nonprofit agencies, based upon selection of a preferred alternative. Section 4.0 provides a description of the potential impacts of six alternatives with respect to the need to relocate existing project area occupants. The location of properties to be acquired, if any, relative to the project boundaries, will be shown on an acquisition map which will accompany the MDP.

Figure 2.3-1 depicts the project area, with designations of map and block numbers. A basic survey of the project area resulted in the identification of the non-residential uses in the project area as presented in Table 2.3-8. Not all of these spaces are occupied at this time. Appendix C provides a complete listing of properties within the MDP boundary.

TABLE 2.3-8
Summary of Non-Residential Uses by Block Number

Assessor's Block No.	Assessor's Map	Business/Non-Profit Agencies
68	22	4
89	22	3
101	22	4
102	22	2
105	22	1
106	22	3
107	21 & 22	10
109	26	1
	TOTAL:	28



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: GIS coverages developed by Milone & MacBroom,
c. and HMA, Inc. Sources include Connecticut DEP,
ity of New London, FEMA, and US Navy. Intended for planning
nly - not for design use.

Figure 2.3-1
Block and Lot Designations

MDP Project Border

Residential properties in the project study area are summarized in Table 2.3-9. Future acquisition of residential dwellings and relocation of occupants, if any, would be undertaken in a process to ensure the availability of resources to accommodate displacees.

TABLE 2.3-9
Summary of Residential Uses by Block Number

Assessor's Block No.	Assessor's Map	Residential Buildings	Potential Households	Total Dwelling Units
68	22	0	0	0
89	22	2	0	4
101	22	13	14	19
102	22	4	7	8
105	22	22	34	41
106	22	7	12	14
107	21 & 22	16	25	29
109	26	0	0	0
	TOTAL:	64	92	115

Upon completion and approval of the Fort Trumbull Municipal Development Plan by the governing body of the City of New London and initiation of the project, NLDC staff and/or its designees will meet with each resident owner and tenant scheduled to be displaced to conduct a survey. The purpose of the survey will be to document the characteristics of each household or business, (i.e., services or products sold, space occupied) and ultimately determine specifications for a new residence or business site. Based upon this information, alternative dwelling units and commercial sites will be identified for these households, businesses, and non-profit agencies.

At this time, the real estate market, both its residential and commercial segments, appears to have a vacancy rate and turnover rate that will satisfy the requirements of potential displacees from the project area. Project relocation staff and/or its designees will follow the Relocation Assistance Advisory Plan to be adopted by NLDC and the City of New London to carry out relocation responsibilities.

2.3.6 Anticipated Relocation Expenses

The total expenses to relocate residential households, businesses, and non-profit agencies from the project area cannot be estimated at this time. Upon completion of the Municipal Development Plan, a determination of the extent of acquisition, if any, will be made and a budget will be established. The budget will include expenditures for eligible moving payments, fixed payments, replacement housing payments, moving personal property and, when necessary, payments for direct losses of personal property. A contingency account will also be budgeted.

Funding for the relocation program is to coincide with the phasing of the acquisition of properties.

Additional information regarding relocation expenses is presented in Section 5.0 of this document.

2.4 Community Facilities and Services

The following information regarding education, health care, public safety, emergency services, and parks and recreation has been taken in part from the City of New London Plan of Development. Personal telephone interviews have been conducted to update

and verify this information, which will serve as the basis for evaluation of potential impacts as presented in Section 4.0 of this document.

2.4.1 Education

The City of New London provides a full range of educational services to its residents. The education system is managed by a seven-member group of elected officials known as the Board of Education. Five elementary schools located throughout the city provide educational services for children in grades K-6. These elementary schools include the Winthrop, Jennings, Edgerton, Harbor, and Nathan Hale Schools. Also included in the school system is the Little Red Schoolhouse, providing special needs programs. Middle school services are provided at the Bennie Dover Jackson Middle School for grades 6-8. The New London High School provides education for grades 9-12.

A number of private schools also exist in the City of New London. Five private schools provide elementary education, including Saint Mary's School, Saint Joseph's School, Solomon Schecter Academy, the Word Center Christian Academy, the Regional Multi-Cultural Magnet School, and the Inter-district School for Arts and Communication (ISAAC). The Williams Memorial Institute provides private education at the junior and senior high school levels.

Both daytime and evening adult education programs are provided to the residents of New London. The city leases a building in the Shaw's Cove Business Park which houses the Adult Education Center. Also located within the city are several institutions of higher learning, including the Sawyer School, Ridley Lowell Business and Technical Institute, Mitchell College,

Connecticut College, and the United States Coast Guard Academy.

The current school enrollment levels are expected to remain relatively stable. As a result, it is not anticipated that any schools will be closed or new schools constructed. At the present time, most of the schools operate at enrollment levels below the rated capacity of the buildings.

Table 2.4-1 lists the grades, current enrollment as of 1998, maximum capacity of each school, and the streets in the Fort Trumbull area of New London in each school district. The majority of the MDP area is allocated to the Harbor School for elementary education. All middle school and high school students in this area would go to Bennie Dover Jackson Middle School and New London High School, respectively.

TABLE 2.4-1
Current Enrollment and Maximum Capacities of New London Public Schools

Name	Grade	Current Enroll-ment	Maximum Capacity	Fort Trumbull Area Streets Assigned to School
Little Red Schoolhouse (special needs program)	ungraded		Not Available	None
Edgerton School	elementary	327	408	None
Harbor School	elementary	377	476	Chelsea Street East Street Goshen Street Maple Avenue Pequot Avenue (1-401) Shaw Street Smith Street Trumbull Street Walbach Street
Jennings School	elementary	382	377	None
Nathan Hale School	elementary	259	408	None
Winthrop School	elementary	271	383	Hamilton Street Howard Street
Bennie Dover Jackson Middle School	middle school	683	728	All
New London High School	high school	726	800	All

Source: City of New London. Board of Education, 1998.

2.4.2 Health Care

The major contributor to the region's health care facilities is the Lawrence and Memorial Hospital located on Montauk Avenue in New London. This facility maintains 350 beds and serves approximately 14,000 hospitalized inpatients and over 100,000 outpatients per year. The hospital is currently under an expansion and modernization project which will bring the facility up to par with some of the other leading hospitals in the state. When the project is complete, the new services will include a new advanced emergency room, a maternity service wing, new operating suites, and a community service center. The expansion project has been divided into three separate phases. Currently, Phase 2 is near completion.

The City of New London is also home to approximately 70 offices of local physicians, dentists, and other health care professionals. The Community Health Center relocated its facility to the Shaw's Cove Business Park in the fall of 1994.

The City of New London Health Department is also active in protecting the health of the public. The Health Department currently oversees a number of programs, including lead abatement, code enforcement, immunization, radon, Aids, teen pregnancy protection, and school dental and health.

2.4.3 Public Safely and Emergency Services

The City of New London provides a variety of police, fire and emergency services in an effort to reduce the loss of life and property and protect the public's safety.

Police Services

The New London Police Department headquarters (staffed 24 hours per day) is located on Governor Winthrop Boulevard. In addition to the headquarters, there are two auxiliary police stations (staffed a portion of the day) located on Bank Street and Truman Street. A total of 90 sworn officers and 20 civilian personnel comprise the New London Police Department. The Police Department also operates 14 marked patrol cars and 10 unmarked cars as well as a marine unit that includes a boat and three officers. (Personal communication, Captain Edwards, July 1998)

Fire and Emergency Services

The New London Fire Department headquarters is located on Bank Street. Two additional fire stations are located on Broad Street and Lower Boulevard. In all, the Fire Department employs 76 people, including the fire chief, deputy fire chief, fire marshal, a fire inspector, and administrative staff. There are no volunteer firefighters. The Fire Department headquarters located on Bank Street also houses one ladder and one tower engine. The Fire Department possesses two additional fire engines held in reserve. (Personal communication, Fire Department administrative staff, July 1998)

In addition to its firefighting related responsibilities, the New London Fire Department serves as the lead resource necessary to abate hazardous materials incidents, rescue operations, radiological incidents, and other emergency incidents.

The City of New London operates an Ambulance Division as part of the Fire Department. The Ambulance Division operates out of the Fire Department headquarters located on Bank Street as well as at the North Station. Two ambulances are operated full

time, with one additional ambulance in reserve. Each ambulance is operated by a two-person crew, with a total of four employees working per shift providing emergency medical services to the community. (Personal communication, Fire Department administrative staff, July 1998)

From the perspective of fire hazard rating of construction materials, 41% (427,200 square feet) of the building stock in the study area is wood framed construction (Class D), and another 18% (185,000 square feet) is wood and masonry framed construction (Class C). There are 423,200 square feet (41%) of masonry/steel construction (Class B or A), reflective of more modern construction techniques. This group includes Buildings 2, 80 and 96 at NUWC, as well as the 194 Howard Street office building.

2.4.4 Parks and Recreation

City-Wide Park and Recreation Facilities

According to information in the 1997 New London Plan of Development, the city owns and operates one regional park, three citywide parks, three beaches, one senior center/auditorium, two historic sites, 11 neighborhood playgrounds, seven neighborhood parks, one pier, one marina, and two open space parks. This park system totals 292 acres at 28 sites and ranges in size from 0.35 acres to 95 acres.

In addition to these public facilities, there are several private and quasi-public facilities located within the city that are available to community residents. These include the Garde Arts Center, Mitchell Woods Park, the U.S. Coast Guard Academy, Connecticut College, the Connecticut College Arboretum, Mitchell College, the BP Learned House, six marinas, a yacht club, a state boat launch, and a number of privately owned

beaches. These facilities add over 220 acres of recreational area to the city. The combination of public and private land held for open space totals 14% of the land area of the city.

Planning for the city park system is currently based upon the Urban Park and Recreation Recovery Action Program. The city is in the process of revising this plan which inventoried and assessed the provision of the parks and recreation services to its residents and established goals and recommendations for future needs.

Greens Harbor Beach and Park is located in the project vicinity. This is a 3.5-acre public recreational facility operated by the City of New London. Caulkins Park is a 12.9-acre park located across the railroad tracks from Greens Harbor Park. Under present day conditions, there are no recreational facilities within the confines of the Fort Trumbull MDP area.

Planned Facilities by the State Department of Environmental Protection

The Connecticut Department of Environmental Protection is planning to take over a portion of the NUWC site for use as a historic state park. Tentative activities include removing numerous incompatible buildings, opening the 19th century fort and blockhouse for visitors, and providing waterfront access. The specific planned components of the Fort Trumbull State Park are described in greater detail in Section 3.0 of this document.

The following discussion is based on the Department of Environmental Protection's application to the Federal Lands to Parks Program administered by the United States Department of the Interior, National Park Service, Northeast Region.

Planning is underway by the Department of Environmental Protection with the City of New London and the Town of Groton in the development of the Thames Maritime Heritage Park in New London. New London is one of six "Tier One" State Heritage Parks projects intended to combine historic preservation, promote tourism and economic regeneration and increase the region's recreational opportunity. Each park is based upon a local theme. The Thames Maritime Heritage Park's theme will be local maritime history with a focus on the Thames River Estuary. Because this significant military history is shared by both sides of the river, the Thames Maritime Heritage Park will be unique in Connecticut in being a multi-municipality facility.

The goal of the heritage park is to link the area's many marine-related attractions, unitizing a visitor center/museum as the focal point. Tour boat rides around the harbor and docking at designated locations will allow visitors opportunities to tour key historic attractions along the Thames River. Some of these attractions will include: Fort Griswold State Park, National Submarine Memorial, New London Ledge Lighthouse, Project Oceanology, U.S.S. Nautilus Memorial, U.S. Coast Guard Academy, Customs House, Shaw Mansion, and Fort Trumbull State Park. The addition of Fort Trumbull State Park is seen as a key to the rebirth of the waterfront in New London and as the cornerstone of the Thames Maritime Heritage Park.

2.5 Aesthetic/Visual Resources

The following discussion provides background on the aesthetic and visual condition of the project area.

2.5.1 Regional Landscape

The southeastern portion of Connecticut falls into two geological areas, the eastern uplands and the coastal slope. Bedrock, composed of mainly metamorphic rocks like schist and gneiss, make up the eastern uplands. Hills rise out of the eastern side of the Central Valley, running mostly north and south, reaching 1,000 feet at the northernmost reach, while the southernmost part reaches only 500 to 700 feet in height, creating a slope of 10 to 20 feet per mile. At the coast, the slope steepens to 50 feet per mile.

The eastern uplands are composed of the Bolton Range, Mohegan Range, and the Windham Hills. This hilly area, aptly named the uplands, is covered with rich soil that is generally quite good for farming unlike much of New England. Yet another aspect of the eastern uplands is the minerals and metals found beneath the rich soil.

The coastal area of southeastern Connecticut is very unique. Unlike the smooth shores of Rhode Island and the southern side of Long Island, Connecticut's shore is rocky and irregular. Made up of salt marshes, freshwater meadows, and beaches, its many notches are well suited for harbors and are largely responsible for the important role maritime industries have played in the past.

New London Harbor is an industrial port serving southeastern Connecticut. The dry docks and other shipbuilding facilities at Electric Boat and the manufacturing buildings at Pfizer are located on the east side of the harbor in Groton. On the west, the NUWC facility, State Pier, Cross Sound Ferry, and the railroad are predominant waterfront features. Urban downtown New London completes the landscape of the outer harbor.

Upstream along the Thames River, north of Interstate 95 and the Gold Star Memorial Bridge, the industrial waterfront continues, but to a lesser extent. The Navy submarine base occupies the east bank of the Thames River, while the U.S. Coast Guard Academy overlooks the river on the west.

Downstream of the project area, to the south, the roadway along Pequot Avenue provides continuous shoreline views. Moving further south, a transition to residential neighborhoods occurs. Ocean Beach is located further south.

2.5.2 MDP Area Landscape

The entire project area has been used extensively by European settlers since the mid 17th century. Little natural landscape remains. The most spectacular area is the bedrock hill upon which Fort Trumbull was built. It commands a fine view of the Thames River and central New London. Even here, the landscape has been cut, filled, and regraded to meet changing needs.

The lower lying areas north, west, and south of the hill have also seen extensive disturbance, typical of older urban areas. The landscape is dominated by wood frame buildings, several industrial buildings, a sewage treatment plant, and roads. Vegetation is limited to scattered hardwood trees in yards, lawns, and hedges associated with the residential landscape. The rock outcrops and the remnant tidal wetlands associated with Bentley Creek are the only remains of the natural landscape features.

The visual quality of the landscape within the project area is best described as being deteriorated. The streets and sidewalks show a lack of maintenance.

Individual structures in the vicinity of NUWC exhibit a similar lack of care, for the most part. The streetscape character, which is likely to have existed in the 18th and 19th centuries, is no longer apparent.

2.6 Public Utilities and Services

Existing utilities are described below. This inventory provides a baseline against which to measure impacts of alternatives, as presented in Section 4.0 of this document.

2.6.1 Water

Source of Supply

The City of New London has operated its own water supply system since 1873 in accordance with an enabling Act of the General Assembly dated June 5, 1871. On March 28, 1997, the operation of the water supply system was transferred to the Professional Service Group, taking charge of all administrative power except for capital projects. Professional Service Group provides public water service within city boundaries, as well as to portions of the Town of Waterford and the Town of Montville.

New London utilizes surface water sources for its supply system. Table 2.6-1 presents storage, water surface area, and watershed data for the active water supplies. These consist of four active reservoirs: Lake Konomoc, Fairy Lake, Barnes Reservoir, and Bogue Brook Reservoir. Lake Konomoc, the principal storage reservoir of the supply system, is located along Lakes Pond Brook, a tributary to the Niantic River, in Montville and Waterford. Fairy Lake, located in Salem, is located along Latimer Brook, a tributary to the Niantic River, and is upstream of Barnes Reservoir

which is located in Montville, also along Latimer Brook. Bogue Brook Reservoir is located in Montville as well, along Bogue Brook.

TABLE 2.6-1
Active Water Supplies

Source	Storage (MG)	Water Surface (acres)	Watershed (sq. mi.)
Lake Konomac	1,216	286.0	1.40
Barnes Reservoir	170	42.2	2.00
Bogue Brook Reservoir	212	110.0	1.65
Fairy Lake	235	121.2	0.89
Beckwith Pond	2	3.7	2.24
Great Swamp	—	—	0.68
Totals	1,835	563.1	8.86

Source: *Comprehensive Water Supply Plan*. City of New London, Water and Water Pollution Control Authority, rev. 1998.
Note: MG is million gallons

Additional supply sources include the Beckwith Pond Reservoir, in Montville at the confluence of Latimer and Bogue Brooks, and the Great Swamp Diversion, northeast of Lake Konomac. An emergency source, Brandagee Lake, owned by the Water and Water Pollution Control Authority (WWPCA), is located at the northern border of New London. An additional emergency source, although restricted and not used, is the small pond known as Bond Reservoir, located immediately north of Fairy Lake.

Future projections provided in the city's Water Supply Plan forecast the population of the New London service area to be relatively stable. However, the adjacent Town of Waterford service population and consumption is growing steadily and is projected to continue to increase. The State Department of Public Heath (DPH) has indicated that system improvements are needed to

increase New London's available water supply in the future. Although the safe yield of the water system meets the current average demands, a water deficit is projected for the 50-year planning period. This supply deficit is projected for systems during a severe drought when the margin of safety falls below 1.0. The margin of safety for a system is defined as the unitless ratio of the water available in the system (safe yield) to the average daily demand. A margin of safety of at least 15% (1.15) relative to a 99% safe yield is recommended by the Department of Public Utility Control (DPUC).

Table 2.6-2 presents safe yield, average daily demand, and margin of safety data for existing conditions and the 5-, 20-, and 50-year planning periods. New London's water supply is projected to fall below the desired margin of safety by the year 2012 and it is projected that the existing safe yield will be exceeded by the year 2030. Even using more conservative population projections, it is anticipated that the margin of safety will be inadequate by the year 2040.

TABLE 2.6-2
Margin of Safety for Current and Projected Consumption Based on Existing Supply Sources

Time Frame	Safe Yield (MGD)	Average Daily Demand (MGD)	Margin of Safety
FY 1993-1997	7.0	5.54	1.26
5-year (2002)	7.0	5.69	1.23
20-year (2010)	7.0	6.01	1.16
50-year (2040)	7.0	7.52	0.93

Source: *Comprehensive Water Supply Plan*. City of New London, Water and Water Pollution Control Authority, rev. 1998.

To address the forecasted deficiencies, the city has submitted an application for a water diversion permit

to the Department of Environmental Protection to develop the Hunts Brook diversion to increase water supply safe yield. The replacement of the Great Swamp pump station has also been identified as a possible action to increase the available yield to the water supply system. Any future development with high water demands would need to be carefully coordinated with the city to ensure that adequate water supply is available to meet such needs.

Table 2.6-3 presents options for increasing the safe yield through various scenarios. It should be noted that a permitted diversion rate does not equate to safe yield and, in fact, is often considerably greater than safe yield.

TABLE 2.6-3
Various Scenarios for Increasing Safe Yield

Description	Safe Yield (MGD)
Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 0.25 MGD Diversion at Great Swamp	7.0
Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 1.2 MGD Diversion at Great Swamp	7.2
Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 1.2 MGD Diversion at Great Swamp 6.0 MGD Diversion at Hunts Brook	9.3
Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 1.2 MGD Diversion at Great Swamp 8.0 MGD Diversion at Hunts Brook	9.4

Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 1.2 MGD Diversion at Great Swamp 10.0 MGD Diversion at Hunts Brook	9.5
Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 1.2 MGD Diversion at Great Swamp 8.0 MGD Diversion at Hunts Brook and 5.0 MGD Diversion at Miller Pond	11.0
Existing Reservoir System with 7.4 MGD Diversion at Beckwith Pond and 1.2 MGD Diversion at Great Swamp 8.0 MGD Diversion at Hunts Brook and 10.0 MGD Diversion at Miller Pond	11.0

Source: *Comprehensive Water Supply Plan.* City of New London, Water and Water Pollution Control Authority, rev. 1998.

Implementation of various combinations of these options would increase safe yield to acceptable levels, with an adequate margin of safety. A regional water supply planning program is currently underway by the State of Connecticut Department of Public Health which will further evaluate supply deficits and potential future supply sources in the southeastern Connecticut region.

Distribution System

The New London Plan of Development and the city's Water Supply Plan indicate that the distribution system storage capacity is adequate for the existing and future demands. The Plan of Development further indicates that the Waterford distribution piping is relatively new

and in good condition. The New London distribution system, particularly in the southern half of the city, was constructed in the early 1900's and is in need of substantial repairs. The system has numerous areas of fire flow deficiencies, reduced pipe capacities, undersized mains and low pressure areas.

Fire flow deficiencies are gradually being addressed through the city's main replacement program. Minor repairs and maintenance have been performed on the Lake Konomac Dam, Barnes Reservoir Dam, and Branegee Lake Dam in response to orders issued by the Department of Environmental Protection. Plans also include installation of the additional instrumentation necessary to assure compliance with the 1997 Safe Drinking Water Act Additionally, a comprehensive metering program, intended to assist in the recovery of lost revenues, is underway to replace all customer meters within eight years.

Remaining deficiencies are addressed in the short-term and long-term capital improvement plans. Two programs are outlined in the capital plan: one for projects specific to the New London distribution system, and the second for overall, joint system improvements.

In the project area, water is supplied through a series of water mains located in the surrounding streets. Table 2.6-4 lists the streets in the project area and the size of the existing service mains.

NUWC operates and maintains its own water distribution system. Water supply to the NUWC property is provided by the City of New London through the Professional Services Group. Pipe sizes on the base range from two to eight inches in diameter. The majority of the water mains are ductile iron, with some concrete-lined pipes.

Fire protection is provided through a series of hydrants located throughout the project area. A total of

30 hydrants are known to exist in the vicinity, two of which are located just outside of the MDP boundary. Table 2.6-5 lists hydrants which have been visually inventoried and their locations. Table 2.6-6 presents available data on hydrant flow testing.

TABLE 2.6-4
Water Service Mains for the Fort Trumbull MDP Area

Street Name	Water Supply Mains
Chelsea Street	6" main
East Street	12" main, 6" main
Goshen Street	6" main
Hamilton Street:	
from Shaw to Howard St.	8" main
from Howard St. to Amtrak RR	8" main
from Amtrak RR to Smith St.	6" main
Harris Street	
Howard Street:	12" main, 10" main
from Hamilton to Harris St.	12" main, 10" main
from Harris St. to Pequot Ave.	6" main
Nameaug Street	10" main
Pequot Avenue	10" main
Shaw Street	
Smith Street:	6" main
from Trumbull to Walbach St.	12" main, 8" main
from Walbach to Chelsea St.	12" main, 8" main
from Chelsea to Hamilton St.	
Trumbull Street:	6" main
from Pequot Ave. to East St.	8" main
to NUWC Base	
Walbach Street:	12" and 8" main, 6" main
from Howard to Nameaug St.	12" main, 8" main
from Nameaug to Goshen St.	two 12" mains
from Goshen to Smith St.	12" main, 6" main
from Smith to East St.	6" main
to NUWC Base	

Source: Professional Service Group Water Department

TABLE 2.6-5
Hydrant Locations

Hydrant Reference	Location
1	Eastern side of Pequot Avenue near future Pfizer site
2	Northwest corner of Maple Avenue and Pequot Avenue
3	Southeast corner of Trumbull Street and Pequot Avenue
4	Northeast corner of Trumbull Street and Nameaug Street
5	Western side of Smith Street near Trumbull Street
6	Northwest corner of Walbach Street and East Street
7	Northeast corner of Walbach Street and Smith Street
8	Northeast corner of Walbach Street and Goshen Street
9	Northwest corner of Chelsea Street and Smith Street
10	Southwest corner of Walbach Street and Nameaug Street
11	Western side of Howard Street near Shaw Street
12	Eastern side of Howard Street near Walbach Street
13	Southeast corner of Hamilton Street and Howard Street
14	Northern side of Hamilton Street near Amtrak railroad line
15*	Western side of Shaw Street near Harris Street
16*	Northern side of Hamilton Street near Community Health Center
17-30	On the Naval Undersea Warfare Center base

*Near but outside the Fort Trumbull Development area border.

TABLE 2.6-6
Hydrant Flow Testing

Hydrant Reference	Hydrant Flow Testing		
	Static	Residual	Flow
1	102	90	1,320
6	98	70	820
12	110	95	2,900
15*	102-110	—	—

The Insurance Services Organization (ISO) provides target fire flows for residential areas of between 750 gpm and 1,000 gpm, and between 1,500 gpm and 3,500 gpm for commercial areas. Based on the available hydrant testing in the project area, available fire flows appear to be inadequate for some uses under existing conditions.

2.6.2 Sanitary Sewer

The City of New London has had sewers since approximately 1890 and a sewer plant since 1929. As of March 28, 1997, water and sewer operations were transferred to the Professional Service Group, except for capital projects. The regional water pollution control facility (WPCF) is located at 100 Trumbull Street in the Fort Area. This facility serves the needs of a large percentage of the City of New London, as well as areas in the Towns of Waterford, East Lyme, and Montville. The facility also treats septic wastes delivered to the facility by way of septic hauling tank trucks from the Towns of Waterford, East Lyme and Montville.

An extensive network of sanitary sewers is located in the project area. The major trunk sewer line which receives the sanitary sewage from the network of collector sewer pipes travels along Howard Street, onto

Nameaug Street, and then onto Trumbull Street before reaching the WPCF. Raw sewage flows to the treatment plant via a 30-inch gravity sewer line and a 24-inch force main. After being treated, the effluent is discharged via diffuser which extends from the west bank of the Thames River out approximately 600 feet from the main channel. This outfall extends along the south side of the NUWC property in an easement. Table 2.6-7 list the streets included in the area along with a description of the sanitary pipes located within the street.

The NUWC base operates and maintains its own sanitary sewer collection system, varying between six inches to 12 inches in diameter, as well as a pump station located adjacent to Pier 7 which discharges to the WPCF on Trumbull Street.

New London has recently approved a major sewer system rehabilitation project for the southern half of the city. This $12 million project is designed to prevent rain and ground water from entering the sewer system and involves the repair, replacement and rehabilitation of gravity sewer lines, force mains, and pump stations to avoid overflows into the Thames River, Long Island Sound, and Alewife Cove. These improvements will bring the city into compliance with an order issued by the Connecticut Department of Environmental Protection that requires the city to eliminate overflow into the Thames River.

The City of New London has retained the engineering consulting firm of Camp, Dresser & McKee, Inc. (CDM) to evaluate several improvements to the water pollution control facility. CDM is currently under contract to the city to identify anticipated flows and loadings to the facility over the next 10 years, evaluate capacity and nitrification/denitrification options within the existing aeration basins, and make recommendations to the WWPCA.

TABLE 2.6-7
Sanitary Sewer Mains for the Fort Trumbull MDP Area

Street Name	Sanitary Sewer Mains
Chelsea Street	none
East Street	8" sewer main, 6" sewer main
Goshen Street	8" sewer main
Hamilton Street:	
from Shaw to Howard St.	27" sewer main
from Howard St. to Amtrak RR	2" force main
Harris Street	15" sewer main
Howard Street:	
from Hamilton to Harris St.	30" sewer main, 24" force main
from Harris St. to Pequot Ave.	15" sewer main
Nameaug Street	30" sewer main, 24" force main
Pequot Avenue	15" sewer main
Shaw Street	18" sewer main
Smith Street:	10" sewer main
Trumbull Street:	
from Pequot Ave. to Nameaug St.	24" force main
from Nameaug to Treatment Plant	14" sewer main, 24" force main
from Treatment Plant to Outfall	New 30" outfall, old 24" outfall
from East to Smith St.	10" sewer main
Walbach Street:	
from Howard to Nameaug St.	none
from Nameaug to Goshen St.	8" sewer main
from Goshen to Smith St.	none
from Smith to East St.	8" sewer main

Source: Professional Service Group Sewer Department

The current plan is to expand the existing CDM scope of work to develop and evaluate several alternatives with respect to permit compliance, odor control, and visual enhancement and process upgrade to meet the goals of the municipal development strategy. The following odor control and visual enhancement issues will be evaluated:

- Evaluate the installation of a security and fire alarm system for the facility and the remote wastewater pumping stations.
- Evaluate alternative ways that activities associated with septage receiving, grit removal and sludge building loading can be accomplished out of sight and under cover from both a visual and odor control standpoint.
- Evaluate the rehabilitation and reactivation of the existing solids dewatering facilities to increase the range of solids disposal options available to improve facility operations and odor control.
- Evaluate installing corrosion resistant covers to completely enclose the three existing primary clarifiers and a new odor control wet scrubber or carbon unit dedicated to contain off-gases from the headworks and primary clarifiers. Redundant odor control equipment will also be evaluated.
- Evaluate the removal of the incinerators and ancillary equipment for visual enhancement.
- Evaluate the removal of the incinerator stacks or incorporation as part of the odor control system to achieve dispersion of treated air for both visual enhancement and odor control.

- Review alternative screen wall concepts at the perimeter of both the north and south treatment areas for visual enhancement and odor control and evaluate installation of windscreens on the primary clarifiers to reduce surface turbulence, improve settling, and reduce odors.
- Evaluate the restoration or repair of perimeter security fencing, including double and pedestrian gate entrances for visual enhancement.
- Evaluate the current lighting levels at the facility, repair or replace area security lighting, and convert photocell operation for visual enhancement.
- Evaluate streetscape improvements to Trumbull, Smith, Walbach and Nameaug Streets, including improvements to the existing riprap slope, installation of street trees, and other potential landscaping improvements.
- Evaluate landscape improvements on the site and recommendations on the cleanup of Bentley Creek and the marina area.
- Evaluate improvements to or removal of the existing one-story brick maintenance building and recommendations on the cleanup of building facades with respect to painting, power washing, or other physical improvements.
- Develop and evaluate alternative methods for screening the sand and gravel storage area and/or providing alternative location(s) for this function.
- Evaluate adding aeration or other measures to the primary effluent wetwell to eliminate dead zones and provide odor control.

- Evaluate ways to screen vehicle or truck parking areas or provide covered and secure parking and storage for vehicles and rolling stock within the existing incinerator building.

2.6.3 Storm Sewer

The existing storm sewer system located in the project area is in poor condition. During several site visits, a total of 45 catch basins were identified in the project area, excluding the NUWC site. Other catch basins may exist on private property. Several of these catch basins were nearly completely silted or filled with standing water. Due to the local topography, additional areas outside of the project boundaries drain into this portion of the storm sewer system.

A number of drainage outfalls exist within the project area as well. Two outfalls empty into Shaw's Cove, north of the project area, one of which empties directly into the cove and the other which first empties into an open channel located at the southern end of Shaw's Cove. Another potential outfall location is in a vacant lot located between Howard Street and Shaw Street. It is believed that another outfall is located in the vicinity of the future Pfizer site near Bentley Creek.

The NUWC base contains its own extensive storm drainage system, including some 86 catch basins which empty into the Thames River at 13 separate outfall locations.

Stormwater quality and discharge issues are discussed in Section 2.9 of this document.

2.6.4 Electric/Energy

Electric service to the project area is provided by Connecticut Light & Power (CL&P). Distribution lines throughout the project area are overhead. Underground distribution lines are located on both Howard Street and Shaw Street north of Hamilton Street. Overhead lines also transport electricity to a power substation located at the northwest corner of the NUWC base. From here, power is distributed to the facilities located on the base. There is no metering of individual buildings at the NUWC site beyond the substation.

Based on the age and physical inventory of the buildings in the MDP area, it is evident that use of energy-efficient appliances and fixtures are generally not in use. However, no detailed data is available regarding current power use or conservation measures in the area.

2.6.5 Gas

The Yankee Gas Services Company provides natural gas service to the City of New London. The NUWC base also receives its natural gas from the Yankee Gas Services Company. All streets except Nameaug Street contain natural gas mains, ranging in size between four to six inches. Pequot Avenue contains one low pressure main and one medium pressure main. All other mains are low pressure.

2.6.6 Telephone

Telephone service to the project area is provided by Southern New England Telephone (SNET) and AT&T. An AT&T fiber optic line runs within the railroad easement to the Walbach Street vicinity and then

proceeds down Howard Street to the north. Telephone service is provided to the project area via a combination of overhead and underground service lines. Overhead lines are located on all streets in the project area. Streets which also contain underground telephone lines include Smith Street, Walbach Street, Hamilton Street, and Howard Street.

2.6.7 Cable

Cable television service to the project area is provided by Eastern Connecticut Cable Television Inc. Cable service is provided via overhead lines to all streets throughout the Fort Trumbull area as well as to the NUWC base.

2.7 Cultural Resources

Given the history of the Fort Trumbull area, identification of cultural resources has been a major focus, both on and off the NUWC property. Numerous cultural resources studies and investigations have been conducted in the Fort Trumbull area over the past decade. More recently, archeological assessments and structural analysis has been conducted within the MDP area. Results of these efforts are described herein.

2. 7.1 Statewide Cultural Resources Policies

The *Conservation and Development Policies Plan for Connecticut* identifies the following policies and strategies for cultural resources:

- Identify and protect critical environmental areas of the state.

- Provide a wide variety of high quality outdoor recreational opportunities to all citizens, emphasizing activities that broaden understanding of and contact with the natural environment.
- Encourage management of natural resources that preserves the diversity of habitats and species and achieves sustainable yields of renewable resources. In particular, retain healthy, vigorous forestlands and achieve sustainable yields of resource-based benefits through scientific management of these resources.
- Encourage a wide variety of cultural opportunities for all citizens.

2.7.2 Cultural Resources at the NUWC Site

Important cultural wealth lies in the historical, archaeological and paleontological resources of the state. Fort Trumbull, located at the NUWC property, is listed on the National Register of Historic Places, which provides for preservation and protection of distinctive characteristics of buildings and places associated with history of or indicative of a period or style of architecture of the nation.

An extensive amount of work has been conducted by the Navy to document cultural resources at the NUWC site, including an intensive historic resources survey and a Phase I archaeological survey. The following discussion is based on work conducted for the Navy by TAMS Consultants, Inc. (TAMS).

Historic Significance of Structures at NUWC

Based on a review of historic uses at the NUWC property and within specific buildings, TAMS (1998) identified a portion of the NUWC property as a National

Register-eligible historic district. In order to be eligible as an historic district, structures associated with Fort Trumbull must have been associated with events that have made a strong contribution to the history of the United States and/or to naval warfare. Normally, National Register eligibility is determined for structures 50 years old or greater. However, the Department of Defense, under mandate from the U.S. Congress, is also responsible to inventory, protect, and conserve the military's heritage resulting from the Cold War, less than 50 years old (TAMS 1998:4-5, 4-6).

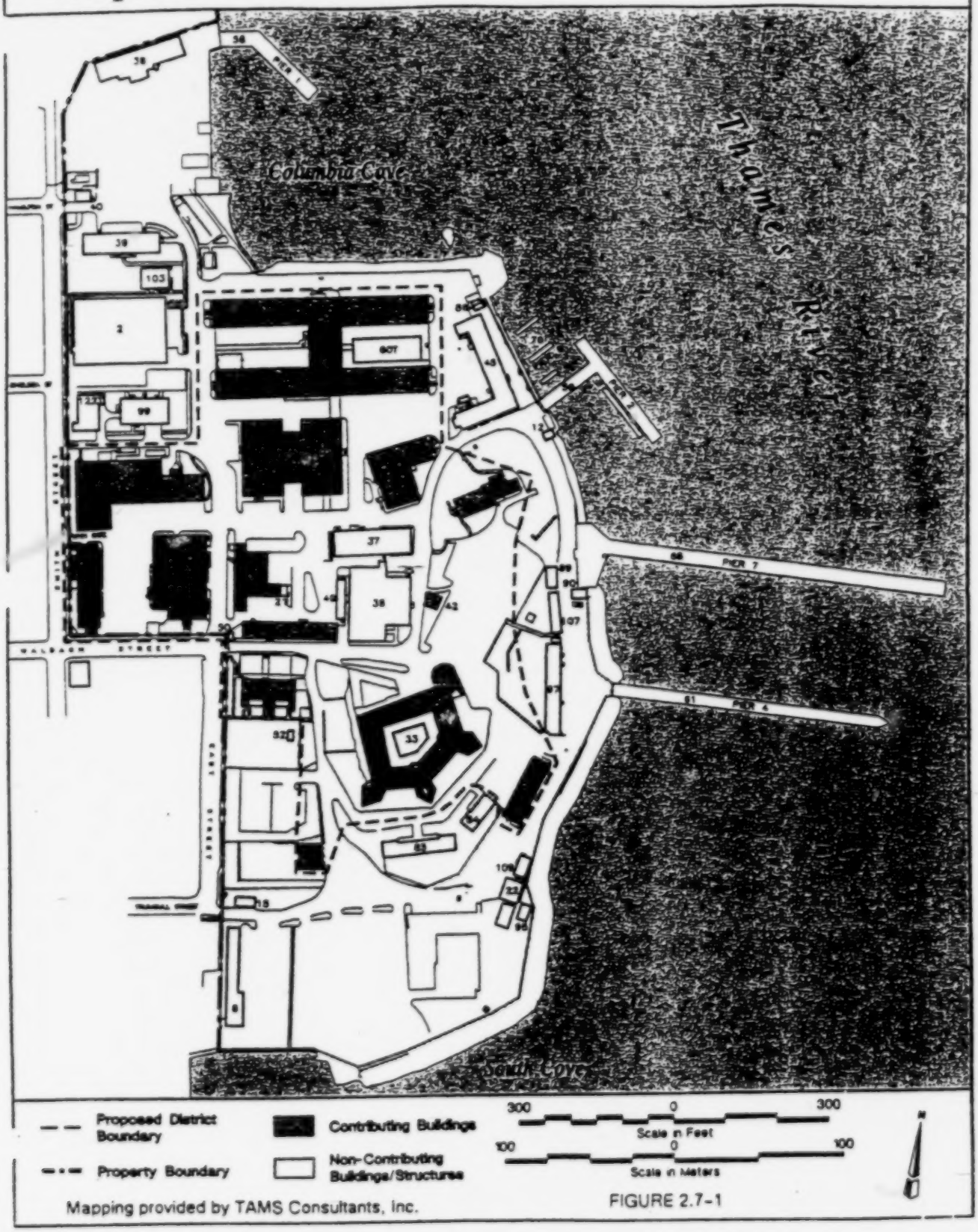
Two buildings are presently listed on the National Register, the Fort (Building 32) and Blockhouse (Building 42), both of which are located on the future state park portion of the NUWC property. Twelve buildings are considered eligible for the National Register associated with 19th century coastal defense, including five buildings in the future state park area: (Buildings 13, 27 and the Rodman Guns). Coast Guard and Merchant Marine training (Building 28), and the Cold War (Building 94), and seven buildings in the future development area: (Building 14), Coast Guard and Merchant Marine training (Buildings 34, 41, and 44), and the Cold War (Buildings 43, 80, and 96). The proposed National Register eligible historic district also contains two noncontributing structures (Building 36 in the state park area and Building 37 in the future development area) (TAMS 1998).

In telephone communications (David Poirier 9/8/98), the Connecticut Historical Commission (CHC) has indicated that designation of a historic district may not require retention of all of the buildings within it. Only one building exclusive of the state park parcel has been identified by CHC as potentially having historic architectural value. This is Building 34 (Bowditch Hall). Documentation of activities at this building

may be adequate for historic preservation purposes. Figure 2.7-1 shows the area which may be eligible for a historic district as well as potentially contributing buildings. CHC has concurred with the TAMS identification of eligibility of these buildings.

Numerous mitigative recommendations have been made by CHC in an October 13, 1998 letter to the Department of the Navy regarding documentation, interpretation, and preservation at the NUWC property. Only two buildings in the future development area are specifically referenced in these recommendations. These are Building 34 (Bowditch Hall) and Building 14. Documentation of Bowditch Hall was recommended. Additionally, preservation covenants were recommended for Bowditch Hall and Building 14 within the future development area to require consultation with the State Historic Preservation Office prior to any proposed alteration, including demolition. A complete copy of CHC correspondence is included herein as Appendix F.

Proposed Historic District at NUWC New London



Mapping provided by TAMS Consultants, Inc.

FIGURE 2.7-1

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An Environmental Impact Statement for the disposition of the NUWC property is currently being prepared by the Department of the Navy but has not yet been issued. Final recommendations for National Register nominations, deed restrictions, and/or future land use development options have not yet been indicated by the Navy.

Archeologic Sensitivity at NUWC

To clarify and confirm the results of background research regarding archaeological potential, archaeological field work was conducted in August and September, 1997 by TAMS Consultants, Inc. and Historical Perspectives, Inc. This work consisted of a surface reconnaissance of the NUWC facility coupled with a limited program of shovel testing.

Five areas were assigned a high sensitivity level because of their potential to contribute to the knowledge of NUWC New London's history and their low level of documented disturbance. These are shown graphically in Figure 2.7-2 and are summarized as follows:

- the tunnel in the southwest bastion;
- the subterranean chamber in the south bastion;
- the subterranean chamber in the southeastern bastion;
- the well located west of Fort Trumbull; and
- the blockhouse basement.

All of these areas are located on the future state park portion of the NUWC site.

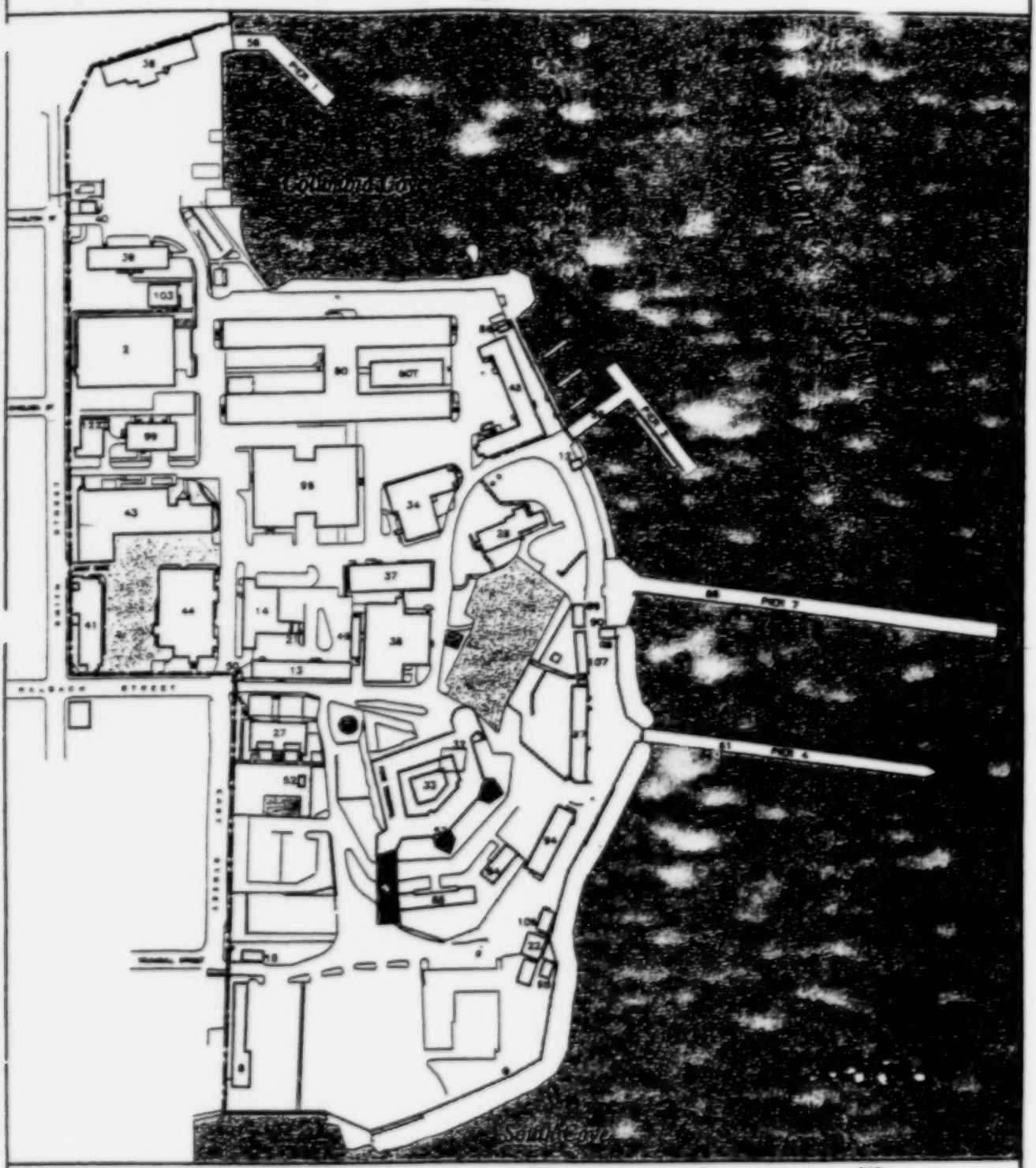
Four areas of medium archeological sensitivity were identified. The first three were assigned a medium level of sensitivity because development has likely diminished their integrity, but their exact state is unknown. No subsurface testing was conducted in these

areas due to extensive paving. A portion of the backyards of Buildings 27 and 52 was also assigned a medium level of sensitivity, as sheet midden dating back to the 19th century was encountered. This archaeological feature can provide information concerning the historic past of the Officers' quarters. Areas of medium archeological sensitivity are as follows:

- the paved area east of Building 34;
- the paved area between Buildings 13, 14, and 49;
- the well located beneath Fort Trumbull (Building 32); and
- a portion of the backyard of Building 27 and 52.

These areas are almost entirely located on the future park portion of the site. The paved area east of Building 34 and the paved area between Buildings 13, 14, and 49 are very close to the proposed park boundary and overlap into the area contemplated for future development.

Archaeological Assessment



Mapping provided by TAMS Consultants, Inc.

FIGURE 2.7-2

Areas of low sensitivity were assigned when there was a potential for buried cultural resources but there was a high likelihood that any buried cultural resources had been highly disturbed by 19th and 20th century development. These include:

- the paved area between Buildings 41, 43, and 44 in the future development area; and
- the paved area east of the Blockhouse (Building 42) in the future state park area.

2.7.3 Cultural Resources in the MDP Area

Staff of the Connecticut Historic Commission (CHC) recommended that a professional cultural resource assessment of the Fort Trumbull MDP area be performed with respect to potential historic and archaeological resources, although, according to CHC, on cursory field review, the existing residential and commercial structures in the area appeared to lack architectural significance and integrity. Such a cultural assessment has been performed in accordance with the Connecticut Historical Commission's *Environmental Review Primer for Connecticut's Archaeological Resources* (Porier 1987). The full document is entitled *Archeological Assessment Survey, The Fort Trumbull MDP Area, New London, Connecticut* authored by Stuart A. Reeve, Ph.D., Archeological Consultant, with the assistance of William F. Keegan and Kristen Nobel Keegan, Keegans Associates, LLC and is dated September 1998. Two copies of this document were forwarded to the Connecticut Historical Commission for their review. A summary of this document follows:

Introduction

An archeological assessment survey was conducted for the Fort Trumbull MDP area, New London,

Connecticut. This assessment survey was conducted to identify sensitive areas for prehistoric and historic archeological resources and to document the development history of the project area.

Study Area

The land area in the MDP vicinity was formerly known as Fort Neck, due to its proximity to historic Fort Trumbull. The MDP project area contains approximately 90 acres, including portions of nine city blocks in what is presently a mixed residential, commercial, and industrial neighborhood. The eastern portion of the project area (approximately 32 acres) was historically occupied by the Naval Undersea Warfare Center (NUWC) facility, which was closed in 1996.

The NUWC site has been studied extensively by the Navy through its consultants. A comprehensive study entitled *Draft Cultural Resources Survey Naval Undersea Warfare Center, New London, Connecticut* by TAMS Consultants, Inc., and Historical Perspectives, Inc. was published in April 1998. There has been no attempt to duplicate the efforts previously undertaken at the NUWC property. Therefore, the cultural assessment focused on the boundary within the MDP area, exclusive of the NUWC site. (See Section 2.7.2 for more information regarding cultural resources on the NUWC property.)

Resources Utilized

Nearly 100 historic maps, aerial photographs, and historic photographs were collected. Historic maps and aerial photographs were compiled using Geographic Information System (GIS) technology to evaluate information concerning changing landforms, environments and historic development of the project area. Local histories, New London City records, City

Directories, architectural surveys, archeological site files and archeological reports were consulted to establish historic and cultural contexts for the project area. Connecticut State repositories for archeological, historical, and environmental information were visited. In addition, local historical societies and libraries, and individuals with knowledge of the project area's prehistory, history, and environments were consulted. These sources are briefly listed below.

Office of the State Archeologist, Storrs, archeological site files.
Connecticut State Archives, Hartford.
Connecticut Department of Environmental Protection, Hartford.
University of Connecticut, Special Collections Library, Storrs.
New London Tax Assessors Office, New London.
New London Department of Economic Development and Planning, New London.
New London Public Library, New London.
New London Historical Society, New London.
Connecticut Historical Society, Hartford.
Fairfield Historical Society, Fairfield.
Milone and MacBroom, Inc., Cheshire.
Keegans Associates, LLC, Willington, historic map collections.
Steven Bedford, former Project Manager for TAMS, Consultants (9/1/98).
Sally Ryan, New London Landmarks (9/1/98).
Dale Plummer, architectural historian (9/1/98).
Dr. David Poirier, Connecticut Historical Commission, Hartford, CT (9/8/98).
Tina Deininger, Historic Preservation Officer, Northern Division, Naval Facilities Engineering Command, Dept. of the Navy, Lester, PA.

Archeological Modeling

The objective of the archeological assessment survey was to identify important cultural and historic contexts that affected the lives of prehistoric and historic peoples who lived within the Fort Trumbull MDP area. Historic maps and aerial photographs provide invaluable insights into the changing ecology of Fort Neck and the surrounding area. Architectural data, maps, photographs, and city records also provide information about the historic development of communities in the project area. Archeological sensitivity reflects both the likelihood that important events occurred at specific locations, and that material remains of those events have been preserved through succeeding ages.

The significance of archeological sites is measured not only by the cultural importance of people or events, but also by the quality of site preservation. Good site preservation provides clearer contextual evidence for time periods when specific places were utilized. Archeological preservation may be poor within the Fort Trumbull MDP area. Approximately 80% of the project area is covered by disturbed urban soils. Shorelines have been filled, and numerous buildings have risen and been demolished over the years. Older ground surfaces or structures may have been buried under fill, or destroyed by bulldozers. House and factory foundations, new roads, water lines, sewer lines, gas lines, telephone cables, television cables and fiber optic cables have been dug deeply through the community, often disturbing earlier archeological remains.

Historical and environmental information from the MDP area allows preliminary assessments of archeologically sensitive areas. Areas of intensive recent disturbances are likely to have no archeological sensitivity. Major disturbances include railroad bed

construction, new buildings, and most streets that have been subject to utility installation and maintenance. Areas of shoreline filling, at least since 1934, are also not likely to contain historically significant archeological remains.

The archeological assessment involved identifying areas of high, moderate and low archeological sensitivity. High sensitivity includes areas that are considered historically significant, and are *likely* to be preserved. Moderate sensitivity includes areas where significant archeological sites are *possible*. Many areas have been classified for low sensitivity based on prior soil disturbances and/or low historical research potentials. Areas of intensive land disturbances are likely to have *no* archeological sensitivity.

Prehistoric Sensitivity

Urban development during the late 19th and 20th centuries probably disturbed most evidence for earlier prehistoric occupations in the project area. Well-drained rocky knolls were probably graded for railroad beds, and lowland areas were filled. Shoreline areas, including Shaw's Cove, were also filled, and houses and factories were constructed on former meadows and marshes. All historic structures caused ground disturbances from foundation excavations, reducing the possibilities for preserved prehistoric sites. Thus, large areas of the project have no sensitivity for preserved prehistoric archeological sites. Formerly well-drained locations, east of Howard Street and west of Pequot Avenue, probably maintain only moderate to low sensitivity for prehistoric archeological sites due to the likelihood of recent disturbances and filling. Areas of former marshes or wet meadows, portrayed on 1848 and 1897 maps, are classified as low sensitivity for prehistoric sites.

Figure 2.7-3 depicts prehistoric archeological sensitivity in the Fort Trumbull MDP area.

Approximately 52% of the project area (excluding NUWC) is presently classified as having no sensitivity for prehistoric archeological sites due to severe land disturbances. Approximately 42% of the area is classified as having moderate to low sensitivity for prehistoric archeological sites due to the likelihood of prior disturbances. Approximately 6% of the area is classified as having low sensitivity for prehistoric sites, due to the presence of former wetlands. More detailed soils and geological testing might reduce the areas of moderate-low and low sensitivity by demonstrating depths of land filling and processes of disturbances. In some locations, urban filling may have buried and preserved prehistoric archeological sites.

Historic Sensitivity

Fort Neck may have been utilized throughout the 17th and 18th centuries for salt marsh harvesting and fishing, although references to specific site locations have not been located, and archeological evidence for these historic activities is likely to be sparse (low sensitivity).

The first intensive historic use of the project area occurred following the construction of Fort Trumbull during 1776-77. Fortifications constructed during the Revolutionary War were probably restricted to the NUWC property (TAMS 1998). Benedict Arnold attacked the fort in 1781, but the battle for the fort was brief and not likely to have resulted in significant archeological remains.

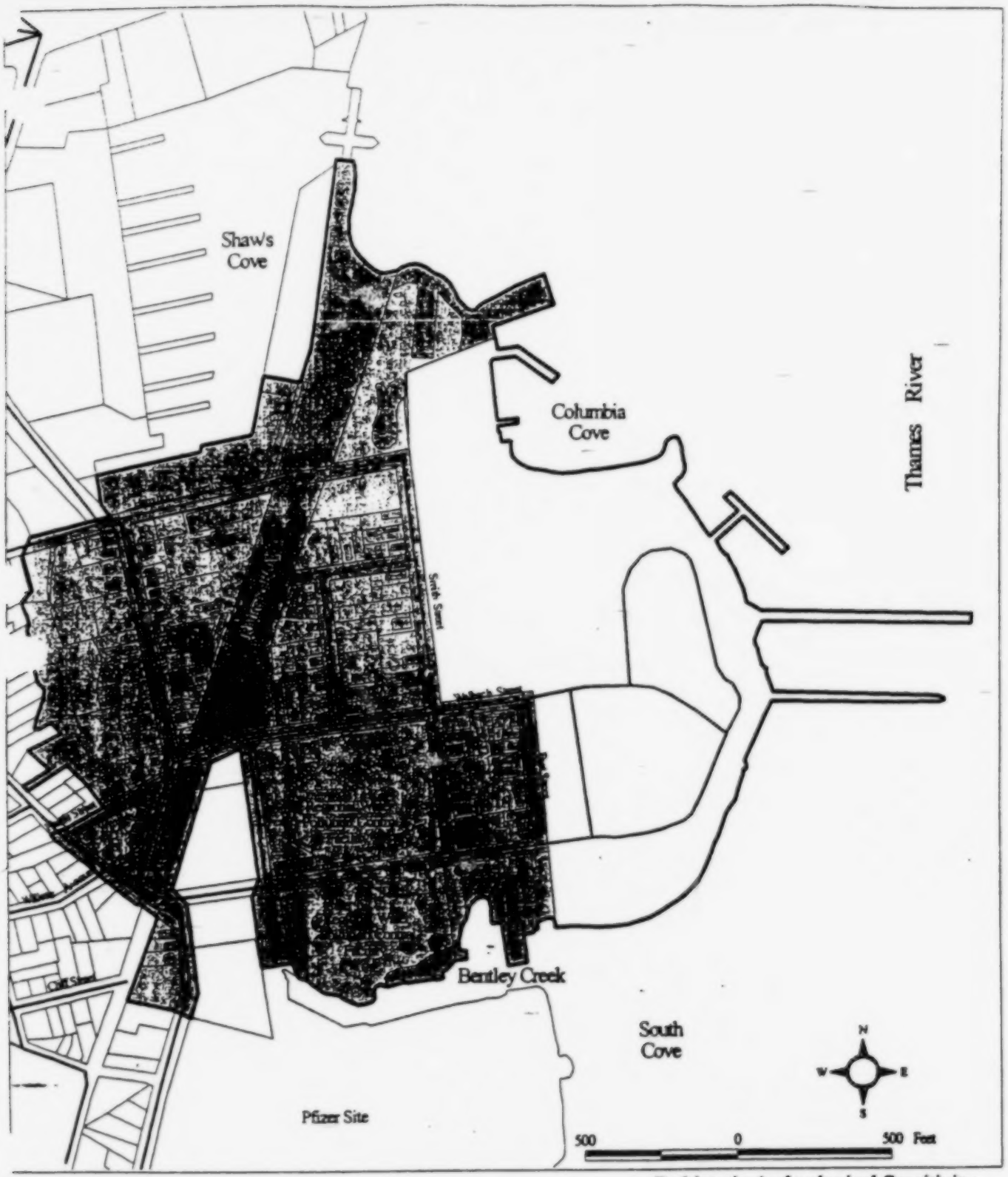


Figure 2.7-3

Prehistoric Archeological Sensitivity

MDP Project Border
Moderate/ Low prehistoric sensitivity
Low prehistoric sensitivity
No prehistoric sensitivity

Fort Trumbull was greatly enlarged during the 19th century. The 1848 Coastal Survey map indicates that fortifications were expanded west of the NUWC property, in the MDP area. The fortifications were probably earthworks, designed to protect the fort from another land attack. Earthworks were probably associated with deep trenches that were later filled and may be preserved in areas of superficial soil disturbances. Historic mapping suggests that fortifications were constructed within the regional Water Pollution Control Facility, north and south of Trumbull Street. The fortifications apparently extended east toward the fort along the south side of Walbach Street. Smith and Walbach Streets have been disturbed by residential construction. Areas possibly containing preserved fortifications are classified as highly sensitive for historic archeological sites.

Residential and industrial development began during the 1850's. Most early industrial sites have been greatly disturbed by expanded facilities during the late 19th and 20th centuries. However, portions of the Fort Trumbull Glass Company factory, on the property of regional Water Pollution Control Facility (between Trumbull and Walbach Streets), and portions of the A. Bragan Ship Yard (north of the NUWC property) may be preserved. These sites are classified as highly significant for historic archeological sites.

Remarkably, most of the earliest residential structures identified on the 1868 Beers maps have survived to the present. Architectural preservation allows an assumption that archeological resources relating to the earliest periods of neighborhood development have also been preserved. Properties dating from 1840 to 1870 are, therefore, considered of high sensitivity for significant archeological sites. Household refuse (ceramics, bottles, tools, and food remains) would be expected to document aspects of

socio-economic statuses, occupations (tools and supplies), and material lifestyles (personal artifacts) of specific families who first occupied the project area.

Many urban lots were intensively utilized, often involving complex changes in the numbers and configurations of buildings on specific properties. New construction usually destroyed evidence for earlier occupations. Yard areas surrounding historic structures were rarely unaffected by utility installations, or brief maintenance episodes. Midden deposits relating to specific periods of occupation often are not preserved in urban settings.

One type of potentially significant archeological feature associated with 19th and early 20th century neighborhoods was the construction of privies (McCarthy et al. 1985; Blomberg 1991). Prior to the development of municipal sewer systems, privies were often located in the rear portions of urban lots. Privy holes were often excavated deeply and were often relocated when filled or when becoming noxious. One strategy for maintaining privies was to deposit household refuse to promote ventilation and oxidation of human waste. Privies, therefore, were repositories for a wide range of household artifacts and food remains that might relate to the material lifestyle of homeowners. Deeply dug privies are likely to be preserved in areas of superficial ground disturbances.

Detailed Sanborn Insurance Maps (1911, 1921-31) were examined for indications of very small outbuildings that may have been privies. Lots that contained possible privies were noted. Historic maps do not reflect the total number of privy features that were probably present in the project area before the construction of the first municipal sewage plant on Fort Neck in 1929.

One of the most significant historic processes that occurred in the MDP area was the ethnic transition from an Irish-English neighborhood during the late 19th century, to an Italian neighborhood during the early 20th century. This process of neighborhood change can be examined archeologically by studying the material remains of different ethnic groups that occupied specific properties in the project area (Cheek and McCarthy 1990). Structures dating to the end of the 19th century (Plummer 1983; Assessor 1998), and/or structures pictured on the detailed 1897 Coastal Survey map, are classified as having moderate sensitivity for archeological deposits that may contain information about neighborhood ethnic changes. Moderate sensitivity is also attributed to lots that have possible mapped privies, properties where ethnicity of homeowners has been identified (Plummer 1983), and properties where specific trades were practiced (e.g., New London City Directory 1915, 1925, and 1930).

Low archeological sensitivity is presently ascribed to most early 20th century houses and lots where ethnicity of residents cannot be demonstrated and where privies or other potential archeological features cannot be documented.

Areas with no archeological sensitivity again include areas of intensive land disturbances, such as streets, railroad beds, large industrial complexes, structures constructed after 1940, and areas of shoreline filling after 1934.

Figure 2.7-4 depicts historic archeological sensitivity in the Fort Trumbull MDP area. Approximately 52% of the project area (excluding NUWC) is presently classified as having no sensitivity for historic archeological sites. Approximately 6% of the area is classified as highly sensitive for historic archeological sites

related to early 19th century fortifications of Fort Trumbull, mid-19th century industries, and early residential neighborhoods. Approximately 9% of the area is moderately sensitive for historic sites relating to late 19th century transition of ethnic neighborhoods. Approximately 33% of the area is characterized with low sensitivity for historic archeological sites, including most early to mid 20th century structures.

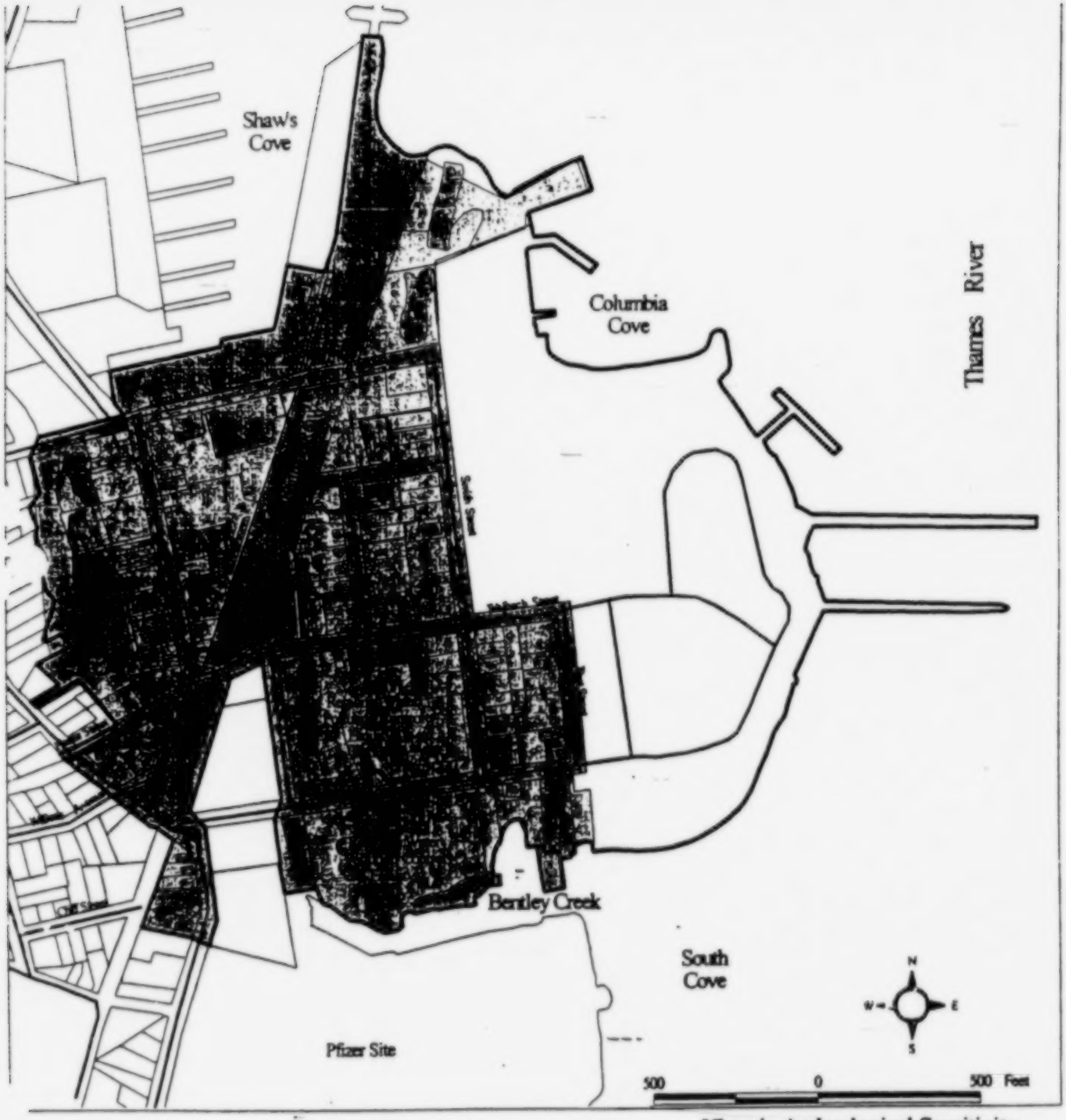


Figure 2.7-4

Historic Archeological Sensitivity

- High historic sensitivity
- Moderate historic sensitivity
- Low historic sensitivity
- No historic sensitivity
- MDP Project Border

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Historic Significance of Structures off NUWC

The CHC has concluded the following: "Cursory field inspection suggests that the extant residential and commercial structures lack architectural significance and integrity with respect to the National and State Registers of Historic Places. However, the historic importance and archeological sensitivity of the study area warrants further investigation." (Maddox 1998).

Several military-related buildings were identified on the 1919 map of Fort Trumbull and the adjacent neighborhood that is outside the present NUWC property. These include structures south of Trumbull Street (Map 21, Block 68, Lot 15) and west of 16 East Street (Map 21, Block 105, Lot 8). These former military buildings have not been evaluated for National Register eligibility. Following submittal of the Archeological assessment survey, the State Historic Preservation Office recommended that additional historic and architectural evaluation be professionally undertaken with respect to these military-related structures (October 14, 1998 correspondence from Dawn Maddox to Jeanine Armstrong Bonin). Accordingly, this level of study will be undertaken. On previous occasion, CHC has indicated that this type of work could be conducted coincident with or following the development of the MDP for this area.

2.8 Traffic and Parking

An understanding of existing traffic and parking conditions in the MDP area provides a baseline against which future land use activities can be measured with respect to traffic volumes and levels of service. Accordingly, existing traffic and parking conditions are described in this section.

2.8.1 Roadway Network

Howard Street, Pequot Avenue, Hamilton Street, Walbach Street and Trumbull Street are the primary streets serving the Fort Trumbull MDP study area. Other streets in the vicinity include Shaw Street, Harris Street, Bank Street, and Willetts Avenue.

There are seven intersections within the project area, including:

- Bank Street at Howard Street, Reed Street and Blinman Street;
- Bank Street at Truman Street;
- Howard Street at Hamilton Street;
- Howard Street at Walbach Street;
- Howard Street at Shaw Street, Willetts Avenue and Pequot Avenue;
- Shaw Street at Hamilton Street; and
- Pequot Avenue at Trumbull Street.

The roadways within the MDP area are described below.

Bank Street – Bank Street is an urban arterial oriented east to west along the northern boundary of the study area. It connects the New London Central Business District to the east with U.S. Route 1 to the west. It is a two-way, four-lane street, with a posted speed limit of 25 miles per hour. It provides three and four lane approaches at its signalized intersection with Shaw Street/Truman Street and with Howard Street/Reed Street, respectively. The principal access to the MDP area will be via the Bank Street/Howard Street intersection.

Howard Street – Howard Street, oriented north to south between Bank Street and the Pequot Avenue/Shaw Street/Willetts Avenue intersection, is a two-way, two-lane street with a posted speed limit of 25 miles per hour. Between Bank Street and Hamilton Street, Howard Street is 48 feet wide and is striped for two lanes in each direction. From Hamilton Street to Pequot Avenue, Howard Street varies from 31 to 35 feet wide and provides one travel lane in each direction.

Shaw Street – Shaw Street is a two-way, two-lane street parallel to Howard Street to the west of the MDP area. The street is typically 31 feet wide with parking permitted on the west side of the street. Shaw Street has a posted speed limit of 25 miles per hour, except in the vicinity of Bank Street where it is 15 miles per hour through a school zone.

Hamilton Street – Hamilton Street is an east-west oriented two-way, two-lane roadway starting at Shaw Street and running east across Howard Street and terminating on the west side of the Amtrak railroad right-of-way. Hamilton Street is approximately 30 feet wide.

Pequot Avenue – Pequot Avenue is a two-way, two-lane street measuring 34 feet in width. It is oriented in a north to south direction and is located at the south end on the MDP area. It begins at the intersection of Howard Street/Shaw Street/Willetts Avenue and proceeds south along the west shore of the Thames River. Pequot Avenue has a posted speed limit of 25 miles per hour between its intersection with Trumbull Street and Shaw Street/Howard Street/Willetts Avenue where it underpasses Amtrak's Northeast Corridor mainline. The road is approximately 46 feet wide at this bridge between an elevated sidewalk on the west, and a curb/vertical abutment on the east. The posted vertical clearance is 12 feet 10 inches.

Walbach Street – Walbach Street is a two-way, two-lane local road providing access to the former Naval Underwater Warfare Center (NUWC) and current U.S. Coast Guard station on the Fort Trumbull peninsula. It is approximately 30 feet wide at its western end and has a posted speed limit of 25 miles per hour. Where Walbach Street underpasses the Amtrak Northeast Corridor mainline, the road is 30 feet wide between the abutments with five foot wide sidewalks on each side of the road. The horizontal alignment of the roadway at the bridge is a series of angular 'S' curves. The bridge at this location has a posted vertical clearance of 10 feet, 0 inches.

Trumbull Street – Trumbull Street is a 32-foot wide, two-way, two-lane local street providing access to the NUWC/Coast Guard facilities. It begins at Pequot Avenue south of the Amtrak bridge and is oriented in an east-west direction.

Willetts Avenue – Willetts Avenue is a 30 foot wide, two-way, two-lane road with a posted speed limit of 25 miles per hour. It provides site access to and from the west toward the Town of Waterford and U.S. Route 1, and terminates at the junction of Howard Street, Shaw Street, and Pequot Avenue.

Harris Street – Harris Street is a westbound, one-way street connecting Howard Street and Shaw Street. The road is approximately 19 feet wide at its eastern end and 17 feet wide at its western end. On-street parking is prohibited on the south side of the street. Harris Street is a conventional three-way intersection at Shaw Street, but has no STOP sign at this location.

2.8.2 Existing Traffic Conditions

The two intersections on Bank Street are under traffic signal control, and the Shaw Street/Hamilton Street intersection is an all-way STOP sign controlled intersection. The remaining intersections are under STOP sign control on the minor street approaches.

The intersection of Howard Street/Shaw Street/Pequot Avenue/Willetts Avenue is operationally confusing, with three raised channelizing islands routing traffic through the intersection. Although Howard Street intersects Pequot Avenue at approximately a 90° angle, these two streets are the main travel routes and are not under STOP sign control. Willetts Avenue and Shaw Street are under STOP control.

In general, all streets in the study area have sidewalks on one or both sides of the street. The notable exceptions are Harris and Trumbull Streets which have no sidewalks.

Capacity analyses at eight study area intersections for existing year 1998 indicate that Levels of Service B or better prevail during the weekday A.M. and P.M. peak highway hours. Level of Service B represents a stable traffic flow with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane operations. Traffic counts are presented in Section 2.8.5 and Appendix D.

2.8.3 Public Transportation

The project area is connected to downtown New London via the South East Area Transit (SEAT) bus service which operates approximately every hour along Howard Street and Pequot Avenue. SEAT has authorized the execution of appropriate route changes to

provide public transportation bus service to Fort Trumbull when it becomes open to the public (SEAT staff, personal communication, October 26, 1998).

2.8.4 Existing Parking

Based on a review of aerial photographs and NUWC reports, there are an estimated 1,817 off-street and on-street parking spaces within the study area, consisting of approximately 1,707 off-street spaces and 110 designated on-street spaces. On-street parking is not typically designated by pavement markings and/or signing, and in the absence of observed parking on many of the study area streets, the number of on-street parking spaces is approximate.

There are an estimated 35 designated on-street parking spaces on Howard Street, plus an estimated additional 75 parking spaces within the NUWC area, for an estimated total of 110 on-street parking spaces. There are approximately 632 off-street parking spaces in the Gateway and Fort Areas, plus an additional 1,075 off-street parking spaces in the NUWC Area, for an estimated total of 1,707 off-street parking spaces.

2.8.5 Historic Traffic

Trumbull and Walbach Streets provide the only vehicular access to the peninsula. Historical traffic counts when NUWC was active were obtained for comparative purposes. Traffic counts were performed in April of 1984 as presented in a June 1987 report entitled *Traffic Study; New London Mills Property; New London, Connecticut* during a period which NUWC was believed to be fully operational.

Based on 1984 traffic volumes on Trumbull and Walbach Streets, there were over four times the number

of vehicles accessing the peninsula area during the 1984 A.M. peak hour as compared to a similar time period in August of 1998. During the P.M. peak highway hour, over three times the number of vehicles accessed the peninsula area in 1984 as compared to 1998. Table 2.8-1 provides a comparative presentation.

TABLE 2.8-1
Comparison of Traffic Volumes (1984 and 1998)

Access Route	1984 Traffic Volumes (NUWC Active)			1998 Traffic (NUWC Inactive)		
	In	Out	Total	In	Out	Total
Walbach Street						
A.M. Peak Hour	411	74	485	41	46	87
P.M. Peak Hour	50	280	310	41	44	85
Trumbull Street						
A.M. Peak Hour	72	52	124	23	28	51
P.M. Peak Hour	29	56	95	17	21	38

2.8.6 Amtrak Operations

The Amtrak rail line runs through the project area, separating the Gateway Area from the Fort Area. Currently, 16 train trips per day run on this line (eight in each direction). Electrification of the rail line is planned and is projected to be operational by the summer of 2000. At that time, 22 trips per day (11 in each direction) are projected. Usage could increase up to 50 trips per day by the year 2010. However, this would be predicated upon meeting conditions, dictated by the Connecticut Department of Environmental Protection.

Amtrak ridership out of New London is currently 150,000 passenger trips per year and is projected to

increase to 300,000 by the year 2010. The speed of trains in the area is not anticipated to increase significantly, since they will be slowing down to stop at the New London station that is located approximately ¼ mile from the project area.

Electric poles will be installed approximately 200 feet on center and be 30 feet high.

2.9 Water Resources

Given the location of the MDP area in relation to the Thames River and Long Island Sound, water resources have been evaluated in the study area as described in the ensuing text.

2.9.1 Surface Water Resources

The dominant water resource in the project area is the Thames River. The project area is located adjacent to the lower Thames River which is influenced by both tidal and freshwater flows. The majority of the freshwater flow stems primarily from three tributaries. These are the Shetucket, Quinebaug, and Yantic Rivers. Several smaller tributaries also feed the river. The Thames River is formed near Norwich, Connecticut and flows approximately 15 miles before it empties into Long Island Sound. Recreation is a primary focus of the river. It supports numerous marinas and yacht clubs and is host to the annual Yale-Harvard Regatta. The Thames River has also been a commercial and industrial shipping port and support for military operations for many decades, including building, docking, and operation of submarines.

The lower Thames River is an estuary and so possesses the qualities which are characteristic of this type of aquatic system. Tidal exchange of the lower

Thames River is from Long Island Sound. The mean tidal range in the Thames River varies from 2.6 feet at New London to 3.1 feet at Norwich. Greens Harbor and Shaw's Cove are both located within this estuary and border the south and north portions of the Fort Trumbull area, respectively.

Tidal flood profiles, developed by the Hydraulics and Water Quality Section of the New England Division of the Army Corps of Engineers, were analyzed to assess the tidal elevations in the vicinity of Fort Trumbull. The mean low water elevation at New London Harbor, immediately south of the project area, was determined to be -0.9 feet NGVD (National Geodetic Vertical Datum). The mean high water elevation at this location is 1.7 feet NGVD. The one-year return frequency tidal flood occurs to elevation 3.6 feet NGVD, while the 100-year frequency flood occurs to elevation 10 feet NGVD. The latter flood events are due to tidal surges rather than riverine runoff.

Any work or construction activity within tidal, coastal, or navigable waters (at or waterward of the high tide line) will require a permit or certificate of permission from the Office of Long Island Sound Programs (OLISP) pursuant to Section 22a-361 or 22a-363b of the Connecticut General Statues and from the Army Corps of Engineers.

2.9.2 Hydrology

The city's land area is divided into three drainage basins. The vast majority of the city is located in the Thames River drainage basin. A small area of the northwestern corner of the city drains into Nevins Brook in Waterford and a larger area on the city's western border drains into Fenger Brook and into

Alewife Cove. Both Nevins Brook and Fenger Brook are part of the Niantic River drainage basin.

The project area is located in the Thames Major Basin; the Thames Main Stem regional basin; and the Thames River sub-regional basin. The Thames Major Basin drains approximately 1,473 square miles, including most of eastern Connecticut as well as parts of Massachusetts and Rhode Island.

2.9.3 Water Quality

Surface Water

Surface water quality may be influenced by both point and non-point sources of pollution. Point sources are well defined, discrete locations such as sewage treatment plant discharges or combined sewer overflows. Non-point sources of pollution include urban storm drainage, surface runoff, erosion, and leachate from broader areas and human activities.

The State of Connecticut has set forth a policy for the management of water quality through the Water Quality Standards and Criteria, wherein criteria and a classification system are applied to all surface water and ground water resources in the state. These classifications establish designated uses for surface and ground water resources and identify the criteria necessary to support those uses. Criteria have been established with respect to desirable use, antidegradation, allowable types of discharges, waste assimilation, and a variety of physical and chemical constituents.

The Thames River, located east of the project area, has been classified as an SC/SB surface water resource. Surface waters designated as Class SC/SB do not presently meet Class SB water quality criteria or

do not support one or more assigned designated uses. The goal for such surface water is to reach Class SB designation. The water quality criteria of the classification goal are applied to any new uses of the waterbody unless, through an approved use attainability analysis, it is demonstrated that one or more uses are not attainable. The Thames River is not used for potable (drinking) water due to its salinity and its classification.

Designated uses of Class SB surface waters include recreational use, industrial and other legitimate uses including navigation. Wastewater discharges are permitted from municipal and industrial wastewater treatment systems as well as cooling water discharges. Class SB surface water is suitable for marine fish, shellfish, and wildlife habitat as well as shellfish harvesting for transfer to a depuration plant or transplant to approved areas for purification prior to human consumption.

Federal law prohibits a state from lowering surface water quality classifications or standards in order to accommodate new or increased wastewater discharges or land use practices which impact a particular watercourse. Therefore, the state must attain and maintain the most sensitive existing and potential use for a respective waterbody.

Ground Water

Ground water sources beneath the project area have been designated as Class GB. Class GB ground waters are classified as those within highly urbanized areas or areas of intense industrial activity and where public water supply is available. Designated uses of Class GB ground water include industrial process water and cooling water. Class GB sources are presumed

not suitable for direct human consumption due to waste discharges, spills or leaks of chemical, or land use impacts. These sources are known or reasonably presumed to be degraded due to pollution from a variety of sources.

Permits may be granted for discharges of treated industrial process waters amenable to further treatment by soils or for the siting of land disposal facilities. The resultant discharges may not cause ground water degradation that could preclude its future use as a drinking water source or prevent maintenance or attainment of adjacent surface water designated uses.

Coastal Stormwater Quality Issues

The *Conservation and Development Policies Plan for Connecticut* recognizes the expanding significance of non-point pollution sources in water quality concerns. In rebuilding or expanding urban infrastructure, the Plan recommends incorporating appropriate stormwater management technologies to minimize adverse impacts of runoff on surface or ground waters. For new development, the Plan promotes the design and engineering approaches to stormwater handling that minimize the amount of impervious cover that results and incorporate non-structural design features and management techniques to renovate runoff.

Adverse impacts on water quality are defined in CGS Section 22a-93(15)(A) as degrading water quality through the significant introduction into either coastal waters or ground water supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, pH, dissolved oxygen or salinity. Stormwater management and the protection of coastal water quality

have been identified by the Department of Environmental Protection as comprising a principal resource concern for any development in this area.

Stormwater runoff is composed of excess precipitation that flows over the ground surface and impervious areas to storm drains or watercourses. Its quality will reflect the land uses and surfaces it contacts. Stormwater runoff from urban areas, including roadways, parking lots, and lawns, has been found to be a significant source of contamination in Long Island Sound. Stormwater management and treatment will therefore likely be required under any future development plan. Specific proposed measures are described in Section 4.7 of this document

2.10 Flood Hazard Potential

2.10.1 Flood History

The project area is located along the west bank of the Thames River, approximately 2.5 miles upstream of Long Island Sound. River estuaries can be subject to two types of flooding: riverine runoff and coastal storm surges that raise tide levels along the shore to create wave run-up.

The Thames River has a watershed area of 1,473 square miles, consisting of rural woodlands, farmland, and moderately developed areas in eastern Connecticut. The river has a length of only 15 miles to Norwich, which is both the head of tide water and the confluence of three major tributaries (the Yantic, Quinnibaug, and Shetucket Rivers). The Thames River does not have significant freshwater runoff related flood problems due to its large width and depth. The principal concern is thus coastal flood hazards.

The hurricane of September 21, 1938 caused tremendous damage in southeastern Connecticut, including coastal sections of New London. The reported water elevation was 9.7 NGVD, just below the forecast 100-year frequency event. This event caused tidal surges of seven to 10 feet higher than predicted tides, destroying hundreds of cottages and buildings and leading to a total of 700 deaths.

Hurricane Carol on August 31, 1954 also struck the project area, with water levels at elevation 8.9 NGVD, and surges of five to eight feet. The center of the storm passed over New London. Winds of 135 mph were recorded at nearby Block Island.

2.10.2 Astronomical Tide Levels

The U.S. Army Corps of Engineers (1988) has developed tidal water profiles for Long Island Sound that are also generally representative of water levels in coastal estuaries and harbors. The predicted tidal water elevations published for New London are presented in Table 2.10-1.

TABLE 2.10-1
ACOE Predicted Tidal Water Elevations

Parameter	Elevation, NGVD
Mean Low Water	-0.9
Mean Tide Level	0.4
Mean High Water	1.7
Mean Spring High Water	1.9
One-Year Frequency Tidal Flood	3.6

2.10.3 Tidal Flood Levels

Statistical data on historic tidal floodwater levels and forecasts of flood height probabilities are available

from both the U.S. Army Corps of Engineers and the Federal Emergency Management Agency (FEMA). The FEMA program is the basis of local floodplain zoning regulations. Jurisdiction is also provided to the Department of Environmental Protection via the Connecticut Coastal Management Act (CCMA) for management and regulation of development and activities adversely affecting the coastal waters of the state. The permit and certification process of the coastal management program considers potential damage to and destruction of life and property to further reduce the necessity of public expenditure to protect future development from such hazards.

The published Army Corps of Engineers tidal flood profiles provide data for Long Island Sound, including the Connecticut shoreline. Their analysis of 340 years of tidal data is a comprehensive evaluation of historic trends, with a sea level adjustment to 1975 for comparative purposes. The tidal flood profiles were revised and reissued in 1988 and are presented in Table 2.10-2.

TABLE 2.10-2
Still Water Flood Levels (NGVD)

Average Frequency	1980 Forecast	1988 Forecast
10-year	6.3 feet	6.5 feet
50-year	8.5 feet	8.9 feet
100-year	9.5 feet	10.0 feet

The height of the storm surge above normal tide levels depends on several factors, including atmospheric pressure, wind direction and magnitude, fetch, wave set-up, storm location and rate of approach, and coastal geometry.

2.10.4 FEMA Regulatory Program

Portions of Fort Trumbull and the surrounding areas contain flood hazard areas as delineated by the Federal Emergency Management Agency (FEMA) Flood Insurance Maps. These are shown graphically in Figure 2.10-1.

Both 100-year V-zones and A-zones are located within the project boundary. The hazard zones designated as zone V represent those highly exposed areas subject to flooding, caused by the combination of coastal waves superimposed upon the 100-year frequency stillwater coastal flood level. Zone A hazard areas are subject to the 100-year storm event caused by the Thames River flooding which, in this case, is the backwater area of the coastal floodway on Long Island Sound. Any reuse proposed for these areas must include plans for flood-proofing any structures within these zones.

Small areas of Zone B – areas subject to the 500-year frequency event – are also located in the project area. All other areas are designated as Zone C, which are areas of minimal flood hazard.

In reviewing the FEMA mapping, it is apparent that the flood hazard boundaries do not fully agree with present topography. Additionally, some of the roads have been altered.

Table 2.10-3 gives a brief explanation of the FEMA map zone designations pertinent to the project area.

TABLE 2.10-3
Explanation of Flood Zone Designations

Zone	Explanation
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
B	Areas between the limits of the 100-year and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

Source: FEMA Flood Insurance Rate Map, City of New London, Aug. 2, 1995

Note: "Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year.

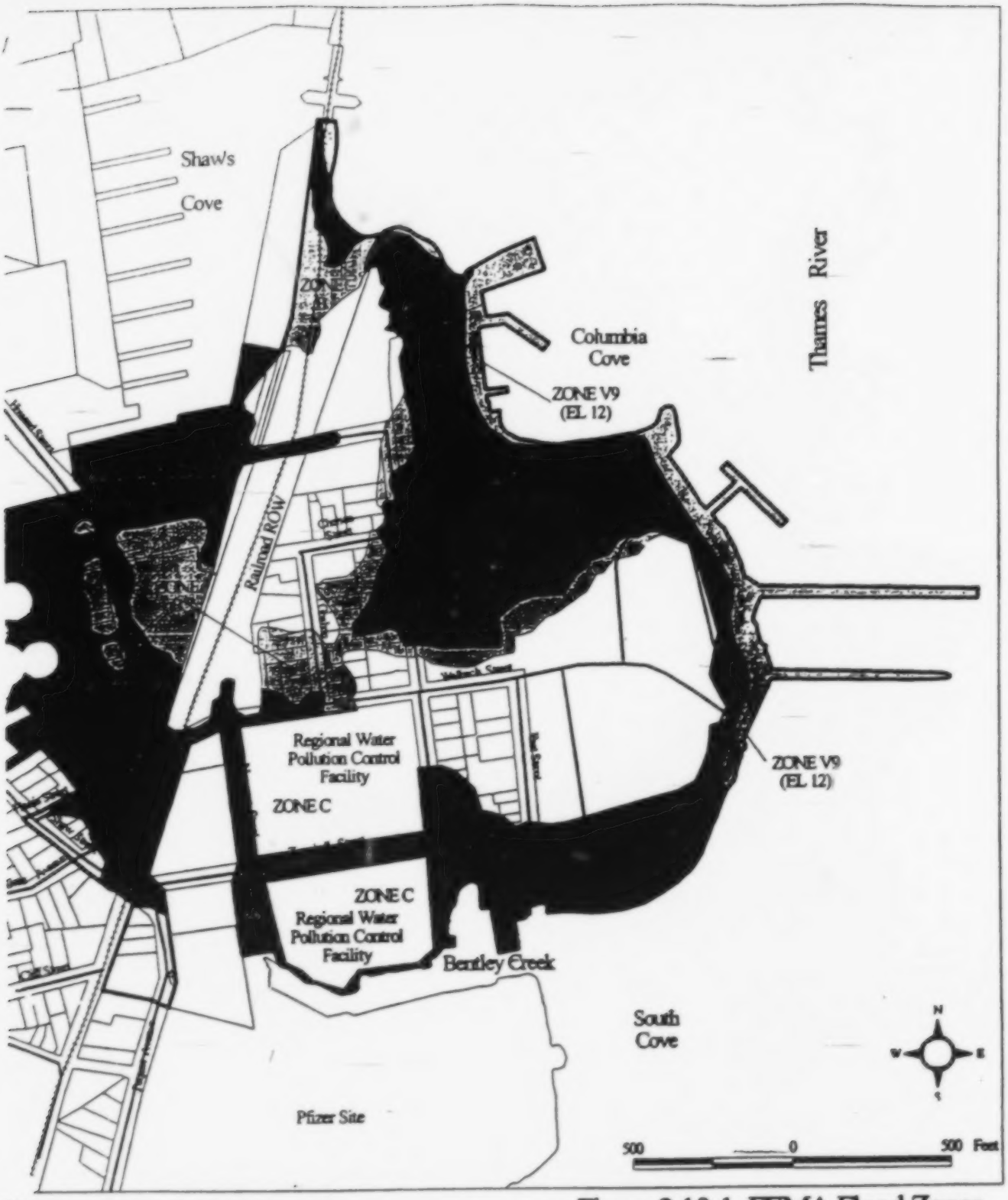


Figure 2.10-1 FEMA Flood Zones

MDP Project Border
Zone A7 - Areas of 100-year flood
Zone B - Areas between limits of 100-year flood and 500-year flood
Zone C - Areas of minimal flooding
Zone V - Areas of 100-year coastal flood with velocity (wave action)

: GIS coverages developed by Milone & MacBroom, and HMA, Inc. Sources include Connecticut DEP, of New London, FEMA, and US Navy.

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The 100-year frequency floodplain is extensive and covers much of Fort Trumbull and surrounding areas. A brief discussion of the major project areas follows:

Gateway Area

Almost all of the Gateway Area is within the 100-year floodplain. Several small pockets of Zone B (areas subject to flooding during the 500-year flood) have been mapped on either side of Howard Street.

Fort Area

Many local roads in the Fort Area are located within the FEMA 100-year flood zone (Zone A7), including a portion of Hamilton Street; the western portion of Walbach Street between Howard Street and Goshen Street; all of Trumbull and Nameaug Streets; and most of Smith Street.

Several areas of low flooding hazard exist on the higher ground in the central part of the Fort Area. One area exists in the vicinity of the elevated wastewater treatment facility which spans both sides of Trumbull Street. Much of the area bounded by the railroad, Nameaug Street, and Smith Street is mapped either Zone B or Zone C, subject to low frequency flooding. The southwest corner of the Walbach/East/Trumbull/Smith Street block is mapped A7, meaning it is within the 100-year floodplain.

Lower Pequot Area

Almost all of the land in the Lower Pequot Avenue Area is mapped as Zone C (areas of minimal flooding).

NUWC Area

According to the FEMA mapping, the central portion of the NUWC site is located on high ground, including the area within the local roadway system on the base.

The northern portion of the site and the perimeter is mapped as either A-zone or V-zone, and would be expected to experience severe flooding during coastal storms.

2.10.5 Conservation and Development Policies Plan for Connecticut

Portions of the project area have been designated as Conservation or Preservation Areas under the *Conservation and Development Policies Plan for Connecticut* (1998-2003). These areas appear to correlate with the mapped FEMA flood prone areas. The state policy for flood fringe development is that it should be planned or supported only when:

- such development will not be of a scale or use as would severely disrupt or burden the economy during flood periods;
- such development will not require future public expenditures for flood control facilities other than those environmentally acceptable local structures that can be incorporated in the project design or financed through benefit assessments by the identified flood fringe users;
- adequate flood insurance protection can be obtained;
- development is in full compliance with building, excavation, and other floodplain and coastal management policies and regulations; and
- adequate civil preparedness (forecasting, notification, evacuation, sheltering) will ensure protection of life and continuance of essential services.

2.10.6 State and Federal Regulations and Statutes

Because state funds are involved, this project must be certified by the Department of Economic and Community Development as being in compliance with flood and stormwater management standards specified in Section 25-68 of the Connecticut General Statutes and Section 25-68h-2 through 25-68h-3 of the Regulations of Connecticut State Agencies.

State policy promotes long-term non-intensive uses for projects within flood hazard areas, with utilities located to discourage floodplain development. The determination of whether a specific proposal is considered non-intensive requires examination of numerous factors, including the existing state of the floodplain and its natural resources, the types of uses proposed for the floodplain area, the design of the entire proposal and the extent of encroachment into the floodplain, and the availability of alternatives to siting within the floodplain. In order to ensure compliance with state policy, any proposed development must not result in more intensive uses of the floodplain than presently exist.

Intensive floodplain uses have been interpreted to include:

- new residential uses within the floodplain;
- any increase in the square footage of office, retail, industrial, or business uses; and
- conversion of non-residential use to residential uses.

Uses that are classified as intensive would preclude use of state funding unless an exemption is granted. Exemptions are unlikely for residential uses. Note that an "intensive floodplain" classification would not be made if the area were first filled (without state funds) and then reclassified through a FEMA map amendment.

In order to comply with the FEMA National Flood Insurance Program management standards and to be consistent with coastal management policies concerning coastal flood hazard areas, the lowest floor (including basement and utilities) of all new construction of non-residential structures must:

(i) ~~have~~ the lowest floor (including basement) elevated to or above the base flood level; or

(ii) together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capacity of resisting hydrostatic and hydrodynamic loads and affects of buoyancy.

In order to comply with Section 25-68 of the flood management standards, which are stricter than FEMA standards for residential buildings, the lowest floor of residential structures must be elevated to one foot above the 500-year flood elevation. These criteria must be incorporated into the design of any structures proposed for the A-Zone portions of the project area. The DEP has indicated that, since portions of the project area access and egress are within the flood zone, a flood management plan with evacuation measures will likely be required.

Of special interest to the Fort Trumbull development is that the access roads pass beneath the Amtrak railroad lines. The Walbach Street underpass near Howard Street is at elevation 4.5 NGVD, and the underpass at Pequot Avenue at Trumbull Street and Howard Street is at elevation 6.8 NGVD. Finally, the old Hamilton Street underpass is at elevation 3.4 NGVD. Consequently, extreme coastal floods could isolate portions of the area and prevent vehicular access for short durations.

2.11 Biological Environment

2.11.1 Coastal Management Policies

The Connecticut Coastal Management Act (CCMA) (CGS Sections 22a-90 through 22a-112) establishes the basis for Connecticut's coastal management program and policies. Specifically, it provides for the protection and enhancement of the wildlife, finfish, and shellfish habitats of coastal waters. Any impact such as significant alteration of the composition, migration patterns, distribution, breeding, or other populations characteristic of the natural species, or significant alterations of the natural components of the habitat, is considered an adverse impact and is subject to state agency jurisdiction (CGS Section 22a-93 (15)(G)).

2.11.2 Fisheries

The Connecticut Coastal Management Act (CCMA) empowers the Department of Environmental Protection (DEP) to manage the state's fisheries for promotion of economic benefits of commercial and recreational fishing; enhance recreational fishing opportunities; optimize yield of all species; prevent the depletion or extinction of indigenous species; maintain and enhance the productivity of natural estuarine resources; and preserve healthy fisheries resources for future generations.

The nearshore estuarine environment provides spawning, nursery, and productive feeding grounds for many of Connecticut's freshwater and marine resources. Finfish are high level consumers in coastal food webs and many are of commercial and recreational importance. Estuarine systems like the Thames River typically provide spawning and feeding habitat for adults of several species as well as feeding and refuge habitat for juveniles (Pellegrino, 1989).

The Thames River estuarine waters extend 15 miles northward from the river's mouth and include the reach adjacent to the project area. A study of nearshore habitat was conducted in the Thames River estuary by the DEP, Fisheries Division in 1996. The study focused on the larvae distribution of winter flounder *(Pleuronectes americanus)*. The total number of winter flounder larvae in the Thames River estuary was estimated at 111 million. The lower third of the estuary, including the area immediately adjacent to the project area, is estimated to support 65.389 million or 59% of the total number of larvae (DEP Fisheries Division, 1996).

In addition to winter flounder, larvae of 20 other finfish were collected in the river during the DEP study. American sandlance *(Ammodytes americanus)* and grubby *(Myoxocephalus aenaeus)* were the most abundant, and were the only species taken in any number in the lower third of the river.

Other DEP studies have shown that winter flounder juveniles use the entire river from head of tide to the mouth of the river. Juvenile densities are highest in the upper reaches of the Thames River near the head of tide.

A lift designed to pass fish at the Greenville Dam on the Shetucket River in Norwich, located approximately 12 miles upstream of the project area, passed the following fish species and numbers in 1998 through June (David Simpson, DEP Marine Fisheries Office, personal communication, July 13, 1998):

American shad:	4,707
alewife:	334
blueback herring:	126
striped bass:	10

Pellegrino (1989) compiled fisheries survey data from a long-term Trawl Survey Program conducted by Project Oceanology (PO), and a Marine Angler Creel Census Survey conducted by the DEP. The area extending from the Coast Guard Academy south to Fort Trumbull was described as follows:

> A total of 27 species were reported from this area of the Thames River. The PO trawl data from 1982-1986 revealed the two most important species to be winter flounder and sanddab *(Scopthalmus aquosus)*. A general seasonal trend in abundance is apparent, with winter flounder being most important in the fall and the sanddab in the spring. Other frequently encountered species were the porgy *(Stenotomus chrysops)*, searobin *(Prionotus sp.)*, spotted hake *(Urophycis regius)*, cunner *(Tautogolabrus adspersus)*, skate *(Raja erinacea)*, and sculpin *(Myoxocephalus anus)*.
>
> The DEP Angler Survey reveals the following species to be important recreational species utilizing this area: cunner, blackfish *(Tautoga onitis)*, mackerel *(Scomber scombrus)*, juvenile (snapper) bluefish *(Pomatomus saltatrix)*, winter flounder, porgy, and butterfish *(Peprilus triacanthus)*.

Fisheries survey data from Fort Trumbull south to Eastern Point was described as follows:

> A total of 22 species were reported from this area of the Thames River. The PO trawl data again revealed the dominants in this region to be winter flounder and sanddab, with the same general seasonal abundance pattern evident. Other species of importance in this area were the sea raven *(Hemitripterus sp.)*, fluke *(Paralicthys*

dentatus), four-spotted flounder *(Paralicthys oblongus),* sculpin, and sea robin.

The DEP Angler Survey revealed general recreational species in this area as described for the area upstream of Fort Trumbull with snapper blues, blackfish, porgy, and winter flounder being most important.

According to DEP, the Atlantic sturgeon *(Acipenser oxyrhynchus),* a state threatened species, is found in the Thames River. The Natural Diversity database also notes that a duck wintering area is located in the river immediately south of the project area (Appendix F). Chasko (DEP) has conducted studies in this area (1989). Any future in-water work would need to be evaluated accordingly. Construction controls on erosion and sedimentation will be important with respect to impacts on fisheries potentially caused by stormwater runoff which discharges into the Thames River.

2.11.3 Living Marine Resources

Shellfish concentration areas, such as those in the New London area of the Thames River, are defined as those actual, potential, or historic areas in coastal waters, in which one or more species of shellfish aggregate. According to the map entitled, "Shellfish Concentration Areas" prepared by the Connecticut Department of Environmental Protection, shellfish in the Thames River in the area of the project area primarily consist of hard clams.

The lower Thames River provides habitat for several shellfish species, the most economically important being the hard clam *(Mercenaria mercenaria).* The eastern oyster *(Crassostrea virginica),* which depends upon hard-bottomed substrate, is of less economic

importance in the lower Thames River (Pellegrino, 1989).

Pellegrino (1989) reported on dominant members of the epifaunal community in the area between the Coast Guard Academy and Fort Trumbull. This included starfish *(Asterias forbesi),* spider crab *(Libinia sp.),* lobster *(Homarus americanus)* rock crab *(Cancer irroratus),* sand shrimp *(Crangon septemspinosa),* and blue crab *(Callinectes sapidus).* The lobster is of major commercial importance, while the blue crab is of recreational importance.

The rock crab dominated most of the sampling periods in the area between Fort Trumbull and Eastern Point, with the starfish and lobster ranking second and third in importance. The mantis shrimp *(Squilla empusa)* was reported in low numbers in this area (Pellegrino 1989).

The Department of Public Health (DPH) has jurisdiction to close shellfish concentration areas if determined that tidal flats, shores or coastal waters are contaminated or polluted to the extent that the waters are not meeting established standards of purity. Such a prohibition of the taking or harvesting of shellfish in these areas may be permanent, temporary, or contingent upon the occurrence of specified events. However, commercial harvesters are not prohibited from taking shellfish from permanently closed areas if they are transplanted to approved areas under permit of the DPH and supervision of other state and local health agencies.

The DPH is empowered to inspect shellfish beds and areas in Connecticut where shellfish are grown or harvested for market; all boats, tools, and appliances used in the production and preparation of shellfish for market; and all wharves or buildings where shellfish

are packed and prepared for sale or shipment for market.

The 1996-1997 Annual Assessment of all shellfish growing waters in New London was completed by the Department of Agriculture Bureau of Aquaculture. This assessment provides the results of monitoring and evaluation of pollution sources and water quality data in accordance with the National Shellfish Sanitation Program Manual of Operations.

The Bureau of Aquaculture Annual Assessment indicates that there are limited oyster and hard-shell clam resources in the Thames River in New London. Soft-shell clams are found in Alewife Cove in eastern New London. There were no active leased shellfish beds or commercial harvesting activities in New London prior to 1995. In 1995, one Bureau of Aquaculture licensed shellfish harvester leased shellfish grounds in New London city waters between Shore Rock off Ocean Beach north to Mamacoke Cove. There is no recreational shellfish harvesting allowed in New London.

The Thames River, in the area immediately surrounding the project area, is classified as a prohibited shellfish area by the Bureau of Aquaculture. The prohibited classification extends from the southbound side of the Interstate 95 Gold Star Memorial Bridge to approximately White Rock. Prohibited areas are state waters that have been classified as prohibited for the harvesting of shellfish for any purpose except depletion and aquaculture operations licensed by the Bureau of Aquaculture. A prohibited shellfish growing area is closed for the harvesting of shellfish at all times. This classification reflects the presence of conditions that could pose a health hazard such as biotoxins.

South of the project area, from approximately White Rock to the Quinnipeag Rocks, the Thames River is classified as a conditionally restricted relay area. This classification indicates that the area is classified and has been determined to meet restricted area criteria. A conditionally restricted relay shellfish growing area is closed when the area does not meet the restricted growing criteria and is temporarily closed by the shellfish control authority. The relay period for this area has been established at 45 days.

2.11.4 Vegetation

The project area can be characterized as an urban setting that has been developed to very near its maximum density. The majority of the project area consists of commercial and industrial buildings, residences, sidewalks, parking lots, and roads. Interspersed throughout the project area are relatively small, vegetated areas consisting of maintained lawns, some with ornamental trees.

The area contains several undeveloped parcels that have become overgrown with invasive plant species. Most of the plant species that characterize these sites are aggressive, non-native species that tend to thrive in areas that have been disturbed.

2.11.5 Inland Wetlands

According to the New London Conservation and Development Plan, relative to other communities in the region, New London contains very few undisturbed inland wetland soils as regulated by Sections 22a-36 through 22a-45 of the Connecticut General Statutes. These soil types include poorly drained, very poorly drained, alluvial and floodplain soils. There are

approximately 12 mapped wetland areas in the city which comprise approximately 140 acres of the city's land area. These areas are regulated by the New London Conservation Commission through the issuance of permits for development activity.

The project area is highly developed and contains many areas that are underlain by artificial fill. A small ephemeral watercourse occurs on a vacant parcel located between Howard Street and Shaw Street in the Gateway Area. The watercourse is approximately six feet wide and conveys stormwater approximately 350 feet from a corrugated metal pipe that inlets at its eastern end to a corrugated metal pipe that outlets at its western end. The watercourse is situated in a depressed channel with steep banks of fill material. Dense vegetation, predominantly Japanese knotweed *(Polygonum cuspidatum)* and common reed *(Phragmites australis),* occurs along the banks of the channel. However degraded, it is likely that this area would be a regulated watercourse under local inland wetlands regulations. Based on field investigations by a certified soil scientist, minimal areas of regulated wetland soils have been identified in this area.

Any future proposed work in areas of potential wetlands would need to be field identified by a certified soil scientist and wetland biologist, and field surveyed.

2.11.6 Tidal Wetlands

The Thames River in the vicinity of the project area is influenced by tidal fluctuations due to its close proximity to Long Island Sound. Mean tidal range at State Pier, New London, located approximately 1.5 miles upstream of the project area, is 2.6 feet. The

spring range is 3.0 feet (NOAA tide tables). Much of the riverbank along the project area consists of fill material that slopes steeply to the river. Most of this steep embankment has been armored with riprap to prevent erosion. Additionally, piers and marinas have been constructed along the Thames River. As a result of this highly modified and intensely developed shoreline, tidal marshes within the project area are limited to one area.

Tidal wetlands occur at the western end of the South Cove near Bentley Creek, located to the south of the project area between the regional Water Pollution Control Facility and the Pfizer site. This area consists of intertidal mudflats bordered by a marsh area dominated by tidal salt marsh vegetation, including saltwater cordgrass *(Spartina alterniflora),* salt hay grass *(S. patens),* spike grass *(Distichlis spicata),* and black grass *(Juncus gerardii).* Landward of this area is a marsh border consisting of high-tide bush *(Iva frutescens)* and common reed *(Phragmites australis).* The common reed is quite pervasive in this area and extends into the dirt parking area located adjacent to the regional Water Pollution Control Facility. This area is planned for restoration in conjunction with one or more related projects occurring in the area.

An open, concrete-lined drainage channel carries stormwater runoff from the Trumbull Street area to the tidal marsh area, running alongside the regional Water Pollution Control Facility. The downstream end of the channel contains a dense growth of common reed.

2.11.7 Wildlife

Following is a characterization of the wildlife habitat within the different project planning areas:

NUWC Facility

NUWC is located in an urban environment within the limits of the City of New London. The facility contains 44 structures and the majority of the site has been filled and paved for development. The minimal open space remaining at the NUWC property is characterized by maintained grass lawns and ornamental trees. As a result of the intensive level of development at the site, there is insufficient natural habitat to support most wildlife species (TAMS 1998).

Regional Water Pollution Control Facility

The regional Water Pollution Control Facility consists of the sewage treatment tanks and equipment, associated buildings, a parking lot, and maintained lawn. This site contains no significant habitat for most wildlife species.

Business/Commercial Parcels

The project area contains many parcels occupied by commercial establishments. These parcels are generally dominated by buildings, walkways, parking lots, roads, and small areas of maintained lawns and ornamental trees. Due to the highly developed character of these areas, they provide no significant natural habitat for most wildlife species.

Single- and Multi-Family Residential Parcels

Many of the residential parcels within the project area contain lawns, some with ornamental trees. These vegetated areas are small, contain very little vegetative diversity, and are not interconnected by wildlife corridors. Therefore, they are not considered

to offer significant wildlife habitat, and it is unlikely that they can support most wildlife species.

Undeveloped Parcels

The project area contains several undeveloped vegetated parcels. Most of the plant species that characterize these sites are aggressive, non-native species that tend to thrive in areas that have been disturbed. Although these areas do not offer significant natural habitat, and are unlikely to support most wildlife species, they are likely to support a limited number of wildlife species that have adapted to life in an urban or near-urban environment. Potential wildlife habitat is likely to exist on the undeveloped parcels for the following species:

Amphibians

- red-backed salamander *(Plethodon cinereus)*

Reptiles

- northern brown snake *(Storeria dekayi)*
- eastern garter snake *(Thamnophis sirtalis)*

Birds

- rock dove *(Columba livia)*
- northern flicker *(Colaptes auratus)*
- American robin *(Turdus rnigratorius)*
- northern mockingbird *(Mimus polyglottos)*
- European starling *(Sturnus vulgaris)*
- song sparrow *(Melospiza melodia)*
- house finch *(Carpodacus mexicanus)*
- American goldfinch *(Carduelis tristis)*
- House sparrow *(Passer domesticus)*

Mammals

- Virginia Opossum *(Didelphis virginiana)*
- gray squirrel *(Sciurus carolinensis)*
- white-footed mouse *(Peromyscus leucopus)*
- Norway rat *(Rattus norvegicus)*
- house mouse *(Mus musculus)*
- raccoon *(Procyon lotor)*

The wildlife species listed above are species that have adapted to life in an environment that has been highly altered by human development. Several of these species benefit due to their interaction with humans.

2.11.8 Species of Special Concern

The Connecticut Department of Environmental Protection's Natural Diversity Data Base (NDDB) was accessed in order to determine if any areas of special concern for endangered and threatened species or significant natural communities exist within the project area. NDDB data indicate that the Thames River adjacent to the project area is an area of concern due to the presence of Atlantic sturgeon *(Acipenser oxyrhynchus)* in the vicinity. Atlantic sturgeon is listed as State Threatened in freshwater.

There is no information to suggest that Atlantic sturgeon spawn in the Thames River. The nearest documented spawning area is the Hudson River in New York. It is believed that young sturgeon remain in the Hudson River for approximately three years before moving out of the river and into an estuarine or marine environment. Immature sturgeon between the ages of three and eight years of age may be seasonally present in the Thames River between April

and September. Presently, there is very little data available on Atlantic sturgeon populations in the Thames River (Tom Savoy, DEP, personal communication):

2.12 Physical Environment

2.12.1 Topography

The topography of the study area is generally flat, with maximum elevation reaching approximately 43 feet NGVD atop a raised area between East Street and Smith Street. Most of the NUWC site is at an elevation of approximately eight feet NGVD, and slopes slightly towards the Thames River, with the exception of the southern portion of the site, where Fort Trumbull is located. This area rises to nearly 40 feet NGVD and has several bedrock outcroppings. The portion of the study area west of the railroad tracks (the Gateway Area) generally ranges in elevation between six feet and 12 feet NGVD. The storm drainage watercourse that occurs on an undeveloped rear parcel along Howard Street is at a low elevation of 1.3 feet NGVD. The remainder of the study area generally ranges between six feet and 40 feet NGVD.

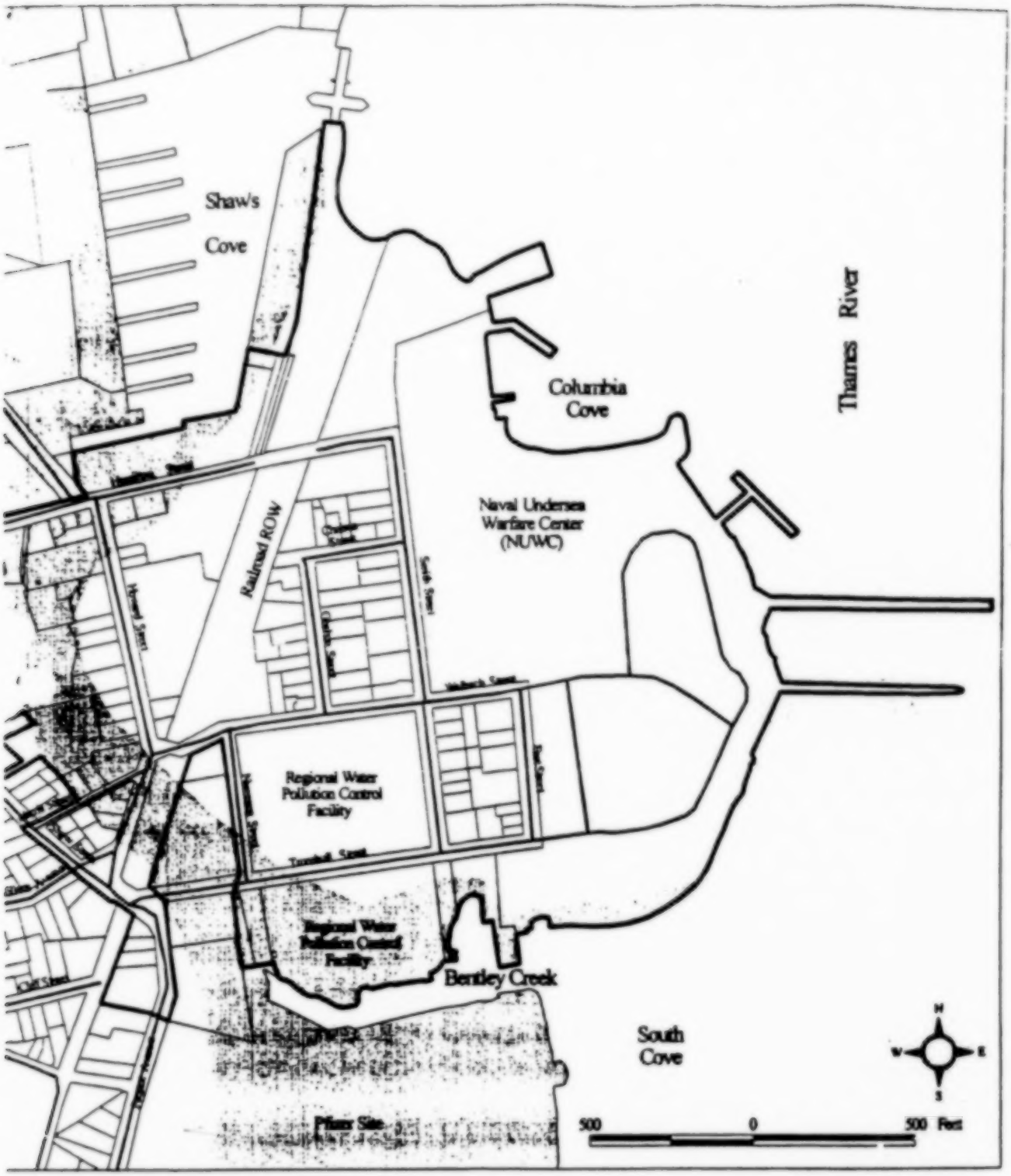
2.12.2 Geology

The City of New London is located in the Eastern Highland physiographic section of Connecticut. The bedrock geology is primarily composed of metamorphic rock such as "gneiss" or "schist." These bedrock formations are overlain by two types of materials primarily deposited by the Wisconsin glaciation which occurred about 15,000 years ago. The dominant material deposited over the bedrock in New London is "till" which is composed of rock particles that tend to be sandy, very stony, and will contain a large percentage

of boulders. Smaller, isolated areas of "stratified drift" contain deposits of sorted layers of sand and gravel primarily along valleys and streams. In New London, this stratified drift is found along Interstate 95, Fenger Brook, Alewife Cove and the Thames River. As a result of the glacier and like much of the surrounding area, the major topographic features of the city are north-south oriented, elongated hills called drumlins. The most notable of these drumlins is the feature which is generally centered along Ocean Avenue in the southern portion of the city. (New London Conservation and Development Plan)

2.12.3 Surficial Geology

Figure 2.12-1 depicts surficial materials in the project area. The surficial materials underlying the project area and the surrounding vicinity have been mapped and described in the publication "Surficial Geology of the New London Quadrangle" by Richard Goldsmith (1962), as published by the U.S. Geological Survey.



ort Trumbull MDP Area - New London, Connecticut
t Environmental Impact Evaluation - November 1998

Figure 2.12-1
Surficial Materials

. coverages developed by Milone & MacBroom,
nd HMA, Inc. Sources include Connecticut DEP,
of New London, and US Navy. Intended for planning
ly - not for design purposes.

MDP Project Border
Artificial Fill
Till
Water

412

503

The majority of the Fort Trumbull project area is underlain by a glacial deposit designated as *Qt* till. *Qt* material consists of compact sandy and gravelly till with a relatively smooth surface. Also included are a few thin masses of loose till and small lenses of stratified material.

Areas of artificial fill, designated as *af,* are also included in the project area. These are generally earth fill and contain little or no amounts of trash. The artificial fill areas include the southern portion of project area, adjacent to Greens Harbor. A narrow band of artificial fill extends to the northwest corner of the project area adjacent to Shaw's Cove. The northeast corner of the peninsula is also underlain by a narrow band of artificial fill along the shore of the Thames River as well as a small section located along the rail line. Much of this area is also floodplain.

A small lens of salt marsh deposits designated as *Qm* located in the southeast portion of the peninsula, adjacent to the sewage treatment plant and Trumbull Street. The *Qm* deposit consists of partly decomposed organic material mixed or interbedded with estuarine silt and sand.

Many outcrops of bedrock formations are located throughout the project area as well. Most occur at the NUWC property and along Walbach Street.

The U. S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), has developed soil mapping of New London County, Connecticut. Figure 2.12-2 presents soil mapping of the project area.

The project area is underlain predominantly by urban land, Udorthents-urban land complex, and Hollis-Chatfield rock outcrop complex. Less predominant

soil types include Charlton-Chatfield complex and Sutton fine sandy loam.

Urban land consists of land where more than 85% of the surface is covered by streets, parking lots, buildings, and other structures. Most of the original soils underlying these areas have been altered by excavating or have been covered with fill material.

The Udorthents-urban land complex consists of excessively drained to moderately well drained soils that have been disturbed by cutting or filling, and areas that have been covered by buildings or pavement. Both the urban land and the Udorthents-urban land complex mapping units require on-site soil investigation and evaluation for most uses.

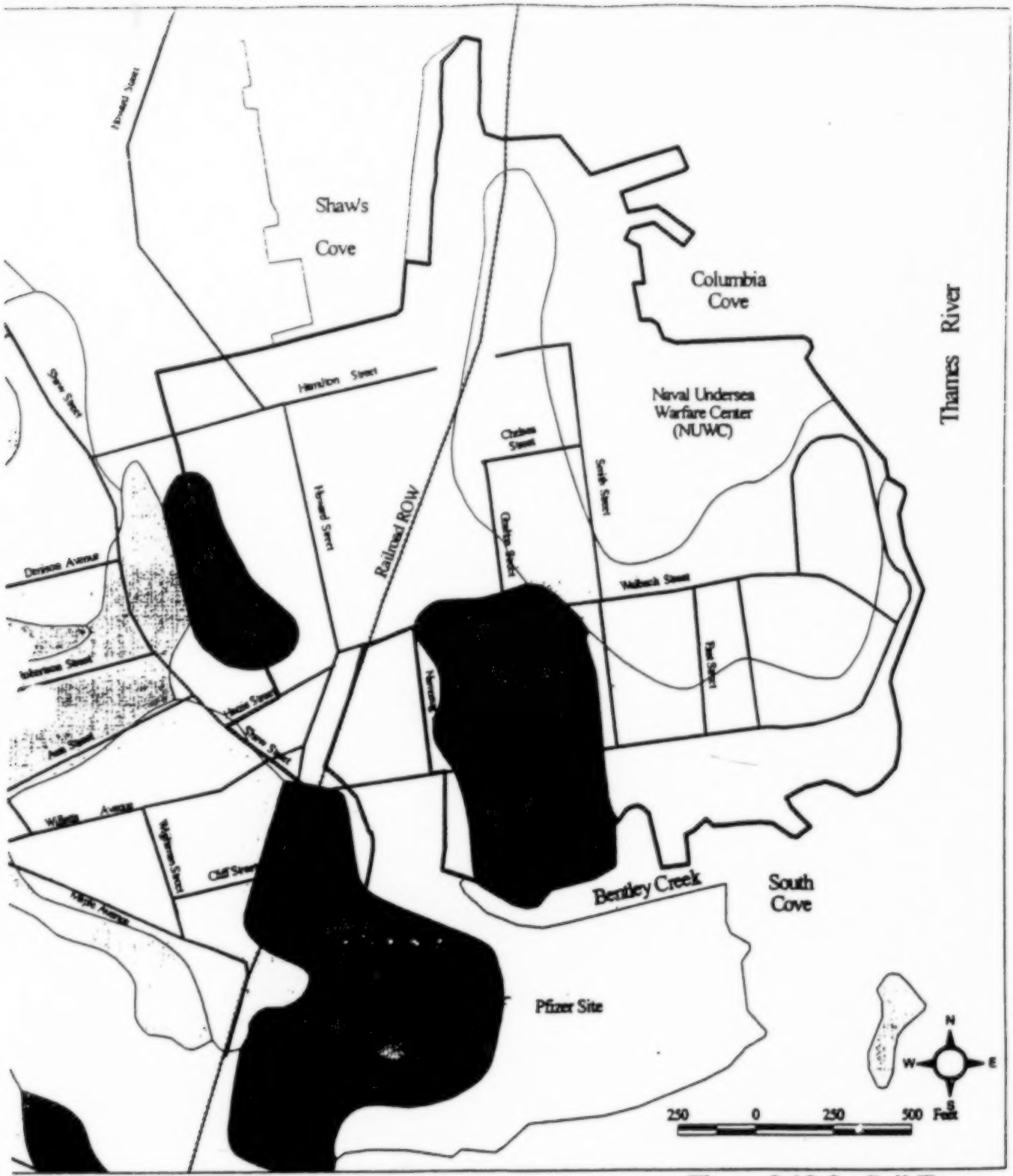


Figure 2.12-2 Soil Types

Trumbull MDP Area - New London, Connecticut
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MDP Project Border
CANTON AND CHARLTON SOILS
CHARLTON-CHATFIELD COMPLEX
HOLLIS-CHATFIELD ROCK OUTCROP COMPLE
ROCK OUTCROP-HOLLIS COMPLEX
SUTTON FINE SANDY LOAM
UDORTHENTS-URBAN LAND COMPLEX
URBAN LAND

.IS coverages were developed by Milone & MacBroom, and HMA, Inc. Coverages are based on data provided by necticut DEP, US Navy, NRCS, and City of New London. ning purposes only - not for design use.

The Hollis-Chatfield rock outcrop complex consists of somewhat excessively drained and well-drained soils and rock outcrop on glacial till uplands. This complex is approximately 40% Hollis soil, 25% Chatfield soil, 20% rock outcrop, and 15% other soils.

The project area generally contains gentle slopes. The majority of this area is covered by buildings and pavement, or by maintained lawn. The predominant soils present consist of artificial fill materials and rock outcrop complex. The general erodibility of the soils which occur in the project area is low.

2.12.4 Bedrock Geology

The bedrock geology underlying the project area and the surrounding vicinity have been mapped and described in the publication "Bedrock Geology of the New London Quadrangle" by Richard Goldsmith (1967), as published by the U.S. Geological Survey.

The Fort Trumbull area is entirely underlain by New London Gneiss, a rock formation designated as *nb*. This formation is a light gray medium-to-fine grained massive gneissic granodiorite with locally quartz monzonite peppered with brilliant black biotite and scattered prominent magnetite grains. The main constitutes are oligoclase and quartz with subordinate microcline. Also present are tabular inclusions of amphibolite, which are most abundant near the contact with the New London Layered Gneiss, *n*. The foliations found in this formation are produced by the parallelism of biotite flakes and streaks of slightly different mineral composition.

2.13 Air Quality

2.13.1 Federal Air Quality Regulations and Criteria

The Federal Clean Air Act was passed by Congress in 1970 and signed into law by President Nixon. This Act required the Environmental Protection Agency (EPA) to ensure that all Americans have safe air to breathe. The Act requires the EPA to: (1) review the public health standards for six major air pollutants every five years; (2) update the standards as necessary to "protect the public health with an adequate margin of safety" based on the most recent studies available and; (3) consider only the public health, not the cost of compliance, when setting air quality standards.

In an effort to achieve the Clean Air Act goals, in 1971 the EPA promulgated primary and secondary national ambient air quality standards (NAAQS) for six pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), and particulate matter smaller than 10 micrometers in diameter (PM_{10}). With the exception of ozone and particulate matter, these standards have not been revised since their inception.

In July 1997, the EPA issued the first update to the NAAQS since the development of these standards. These updated standards were developed as a result of scientific evidence that the existing standards did not adequately protect public health. In the case of ozone, long term exposure at levels below the primary standard were found to cause significant health impacts including asthma, respiratory problems and loss of lung function. The new 8-hour ozone standard became effective 60 days after promulgation of the standard in June 1997. The 1-hour standard will remain

in effect until the EPA determines that an area has met this 1-hour standard.

In the ease of particulate matter, it was determined that significant health effects, including premature mortality, hospital admissions and respiratory illnesses were likely to occur at levels below the existing standards. Evidence indicated that "fine" particles (smaller than 2.5 micrometers in diameter) are more likely than "coarse" particles (those ranging from 2.5 to 10 micrometers in diameter) to contribute to adverse health effects. This evidence led to the development of air quality standards for particulate matter less then 2.5 micrometers in diameter.

Monitoring associated with the new particulate matter standard is hindered by the lack of a monitoring network capable of measuring fine particles. Currently, the EPA is seeking resources to fund the development of a monitoring system capable of measuring fine particulate matter. This network is to be phased into service over a three to four year period beginning in 1997, beginning with major metropolitan areas of over 500,000 persons. After monitoring locations in the major metropolitan areas are established, each state will be required to have two $PM_{2.5}$ monitoring locations by the end of 1998. Compliance with this new standard will not be determined until three years of monitoring data have been developed for each specific sample location. As such, compliance with the $PM_{2.5}$ standard has not been established in Connecticut.

Table 2.13-1 provides a summary of the NAAQS.

TABLE 2.13-1
Summary of NAAQS

Pollutant	Primary Standard[1] ($\mu g/m^3$)	Secondary Standard[2] ($\mu g/m^3$)
Carbon Monoxide*		
(8-hour max.)	9,000[3]	NA
(1-hour max.)	35,000[3]	NA
Nitrogen Dioxide (mean)	100	100
Ozone		
(8-hour max.)	0.08 ppm[4]	0.08 ppm
(1-hour max.)	0.12 ppm[5,6]	0.12 ppm
Particulate Matter (PM_{10})		
(annual mean)	50	50
(24-hour max.)	150[8]	150[7]
Particulate Matter ($PM_{2.5}$)[9]		
(annual mean)	65[7]	15
(24-hour max.)	65[7]	65
Lead (quarterly mean)	1.5	1.5
Sulfur Dioxide (annual mean)	80	NA
Sulfur Dioxide (24-hour max.)	365[3]	NA
Sulfur Dioxide (3-hour max.)	NA	1300[3]

Notes:
1. Primary standards were established with goal of protecting human health. 1 $\mu g/m^3$ is equivalent to 1 ppb. 10,000 $\mu g/m^3$ is equivalent to 10 ppm.
2. Secondary standards are intended to prevent environmental and property damage.
3. Limit not to be exceeded more than once per year.
4. Defined in 1997 by EPA as the three year average of the annual 4th highest daily maximum.

5. Level not to be exceeded more than once per year.
6. 1-hour ozone standard to be replaced with new 8-hour standard.
7. Twenty-four hour average, not to be exceeded more than once per year.
8. Established in 1997 as an update to the NAAQS.
9. Compliance is achieved when the 3-year average of the annual arithmetic mean is less than or equal to standard.
10. Compliance is based on the 98th percentile of 24-hour concentrations in a year (averaged over 3 years).

2.13.2 Statewide Air Quality Policies and Regulations

The *Conservation and Development Policies Plan for Connecticut* recognizes that Connecticut has seen major improvements in air quality over the past 20 years. However, additional affects of air pollution are being identified, and new concerns are emerging that will require greater control efforts. Balancing air quality gains with the costs of such controls and the ability to provide for economic development is a critical planning concern.

Reported air emissions of toxic substances declined from 12,700 tons in 1988 to approximately 4,000 tons in 1994. A major hazardous pollution issue under intensive study is the airborne transport of mercury that is ultimately deposited on land or in surface waters. Fish from several state lakes show unsafe levels of the metal and the DEP has issued advisories

concerning eating them. Emissions from outside the state may play a significant role.

Below is a list of the policies and strategies for air quality from the State of Connecticut Conservation and Development Plan.

- Seek to attain National Ambient Air Quality Standards by the applicable deadlines with emphasis on cost-effective strategies and effective enforcement.
- Develop strategies to achieve and maintain healthy air quality that will enable and foster economic development within the urban areas of the state as designated within this Plan.
- Foster transportation and development plans and projects that promote attainment and maintenance of healthy air.
- Establish and maintain standards that will protect citizens from the dangers of hazardous air pollutants and integrate monitoring and regulation of such pollutants into air quality enforcement activities.
- In order to reduce the risk of global climate change, seek to reduce statewide carbon dioxide emissions to 1990 levels and to reduce further where technically and economically feasible. Also, seek to reduce emissions of other substances that contribute to global warming.

Air quality monitoring is performed on a regular basis in Connecticut by the Department of Environmental Protection for the following parameters:

- Particulate matter smaller than 10 micrometers (μ) in size (PM_{10})
- Ozone

- Sulfur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)
- Lead (Pb)
- Carbon Monoxide (CO)

The results of this monitoring are published in an annual report summarizing air quality in Connecticut. The most current published data, presented in the 1996 annual summary of air quality data, indicates that Connecticut has achieved attainment of EPA criteria for NO_2, Pb, and SO_2. Attainment has not been achieved for CO, ozone and PM_{10}. Non-attainment occurs when one or more of the standards for that pollutant (24-hour average, daily maximum) have not been attained in one or more regions of the state.

Air quality monitoring shows that Connecticut now meets health-related standards for five of the major pollutants regulated under the federal Clean Air Act. The New London area is not currently monitored for nitrogen dioxide, lead or sulfur dioxide concentrations. However, all monitoring locations in the state are in attainment for these criteria and, consequently, the state is said to have attained compliance with EPA criteria. These pollutants are transported via wind from west to east and their concentrations in ambient air are considered to be a direct result of activities which occur in metro New York and New Jersey. The effects of the pollutants from the Metro New York area decrease to the east along the Connecticut shoreline, with the highest concentrations typically measured in lower Fairfield County.

Air quality monitoring data for 1997 is available on the DEP internet web site. Results of air monitoring indicate that the majority of the State of Connecticut is classified as serious non-attainment for ozone concentrations, while Fairfield County (less Shelton),

New Milford, and Bridgewater are considered to be in severe non-attainment. Ozone monitoring is conducted in 12 locations throughout the state and, in 1997, eleven of these monitoring locations were in non-attainment for exceedance of the primary 1-hour ozone standard. An exceedance of this standard is defined as an hourly concentration of 0.125 ppm or greater. Only one monitoring location, located in Torrington, was in compliance with the ozone standard. The Groton monitoring location exceeded the 1-hour ozone standard on four days in 1997. This is an increase over the one day of exceedance in 1996. Of the twelve monitoring locations in the state, only Madison, Stratford and Westport exceeded the 1-hour ozone standard more frequently than Groton. Each of these monitoring stations reported six days of non-compliance in 1997. Groton and Danbury each had four days of non-compliance.

Preliminary 1998 data (partial year) indicates the 1-hour standard was exceeded once at the Groton station, as compared to the four exceedances recorded in 1997. Other data collected during the 1998 ozone monitoring season indicates that the Groton station exceeded the 8-hour ozone standard on three days. The 8-hour standard was exceeded 25 days in the state in 1998. All 1998 ozone monitoring information was taken from data posted on the DEP Air Management Bureau internet web site. However, this data is considered to be preliminary and has not been validated.

Variations in ozone concentrations are attributed to variations in weather patterns, including wind direction, ambient temperature, and amount of sunlight. The DEP database indicates that the highest ozone levels occur on days with persistent winds out of the southwest. During the period between 1981 and 1995, 74% of the annual ten highest daily 1-hour average

concentrations of ozone occurred when southwesterly winds prevailed. This is attributed to two features of southwest winds, one being that these winds are usually associated with high temperatures and bright sunshine which increase ozone production, the other being that they transport precursor contaminants from the New York metropolitan area to southern area of Connecticut. The occurrence of high ozone levels on non-southwest wind days indicates that continuation of the pollution control programs in the state are required to reduce ozone generation within the state.

Particulate monitoring was conducted at 21 locations throughout the state in 1997. Measurements at all monitoring locations did not exceed the primary or secondary annual standards for particulate matter. The 24-hour standards were not violated in 1997 at any monitoring locations. Results of monitoring completed in 1997 follows the trend documented in 1996, when all monitoring locations were considered in attainment, except the City of New Haven. The maximum 24-hour concentration at the New London monitoring location was measured as 66 $\mu g/m^3$ in 1996 and 65 $\mu g/m^3$ in 1997, well below the EPA limit of 150 $\mu g/m^3$. Historical monitoring data from the New London station indicates the arithmetic mean of the PM_{10} for the 1995, 1996 and 1997 monitoring years was 16.7, 18.3 and 17.9 $\mu g/m^3$, respectively. These concentrations are well below the NAAQS of 150 $\mu g/m^3$. These means are consistently among the lowest in the state, with the exception of other monitoring locations, located in the eastern portion of the state such as Voluntown and Willimantic.

Connecticut did not report any exceedances of the one-hour or the eight-hour carbon monoxide NAAQS at any of the five monitoring locations in 1997.

According to the 1996 Annual Air Quality Summary, Connecticut has a mixture of attainment and non-attainment areas for carbon monoxide. Fairfield County, Bridgewater, and New Milford are classified as moderate non-attainment. New Haven County, Bethlehem, Watertown, Woodbury, and Shelton are considered as unclassified non-attainment. These areas were formerly considered to be part of the New Haven/Hartford/Springfield air quality region that had been designated as non-attainment due to air quality in New Haven. Carbon monoxide levels have not, however, been measured in the recent past in these areas at levels that exceed the air quality standards. Hartford, Tolland, and Middlesex Counties and Plymouth were classified by the EPA as attainment areas in 1996. Remaining areas of the state, including New London, are classified as unclassified attainment. This designation reflects the fact that, although carbon monoxide monitoring has not been conducted in the region, the status of attainment can be inferred from population and traffic density data.

Carbon monoxide concentration is generally considered to be a function of land use, land use density, and transportation related activity. Background CO levels in the project area are not available through published reports.

2.13.3 Site Specific Air Quality Analysis

A local air quality analysis was conducted by consultants under contract to the Navy for carbon monoxide to establish existing levels in the project area. Local CO concentrations were estimated through the use of computerized mathematical models. Worst-case CO levels were calculated for the peak one-hour and eight-hour time periods, which correspond to the averaging periods of the state and federal ambient CO

standards. Modeling results are included in Table 213-2.

TABLE 2.13-2
Estimated Carbon Monoxide Levels in the Project Area

Receptor	One-Hour Concentration (ppm)	Eight-Hour Concentration (ppm)
Bank Street and Truman/ Shaw Street	8.6	6.0
Bank Street and Howard Street	8.9	6.2

Note: 1. CO levels include background concentrations of 4.3 ppm (1-hour) and 3.0 ppm (8-hour).
2. Values are for the pm peak period.
3. 10 ppm is equivalent to 10,000 µg/m3.

Comparison of these values to the NAAQS indicates the carbon monoxide levels in the project area are well below the national standards.

The dominant emission sources on the NUWC base are reported to be the three major heating boilers which operate under air permits issued by the DEP. These boilers provide heat and hot water for NUWC buildings. Other sources, such as small heating boilers being used by the Coast Guard, are considered minor emission sources that do not require air permits.

The regional WPCF is also an emission source. Between January 1995 and October 1997, a total of 13 odor complaints were recorded by the DEP (Schuler, 1997). All of these complaints were from residents located within a 100-foot radius of the facility. Additional odor control measures are currently being evaluated for this facility.

2.14 Noise

2.14.1 Local Noise Policies and Regulations

The Plan of Development adopted by the City of New London in 1997 identifies the development of a noise control program to reduce levels of harmful noise as a goal of the city. Noise is regulated in the city via police patrol, as required by the New London Code and the Zoning Regulations. These ordinances authorize the control of sound amplifying devices. construction activities, and all other operations that may be viewed as a nuisance to neighboring properties or the general public. Motor vehicles and railroad noise are considered to be principal sources of noise, with the major emitters considered to be Interstate 95, State Route 32 and other major roads.

The City Zoning Ordinances limit the sound level of all activities except the following:

- noise created as the result of an emergency;
- construction and demolition activities during the daytime;
- blasting other than that associated with construction activities between the hours of 8:00 a.m. and 5 p.m.;
- city sponsored recreation activities such as parades and fairs;
- noise generated by maintenance activities for landscaping and snow removal; farming activities;
- noise generated by transmission and distribution facilities and substations of public utilities; and
- noise that is caused by the flight operations "specifically preempted by the Federal Aviation

Administration" shall not exceed the standards of the State Statutes.

The zoning ordinance limitations are presented in Table 2.14-1.

TABLE 2.14-1
City of New London Noise Restrictions

Zone	WC-1, L1-O	C-1, C-2, CBD, WD	R-1, R-2, R-3, R-4. WD, INST, NB
Noise Limit	70 dBA	66 dBA	Day: 61 dBA/Night: 51 dBA

Note: Night is defined as 10 p.m. to 7 a.m. (10 p.m. to 9 a.m. on Saturday)
Day is defined 7 a.m. to 10 p.m. (9 a.m. to 10 p.m. on Sunday)

2.14.2 Noise Measurements in the Project Area

A noise measurement survey was conducted in the project area in conjunction with the planned disposition of the NUWC site. The following information has been obtained from the Navy's consultant:

Four monitoring locations were selected to provide measures of the existing noise levels. Figure 2.14-1 is a location map showing these locations. Locations are as follows:

- Site 1 – Along the east side of Pequot Avenue between Trumbull Street and Maple Avenue;
- Site 2 – West of NUWC near the property boundary along East Street;
- Site 3 – At 202 Shaw Street between Denison Street and Ann Street; and
- Site 4 – At 211 Howard Street between Hamilton Street and Walbach Street.

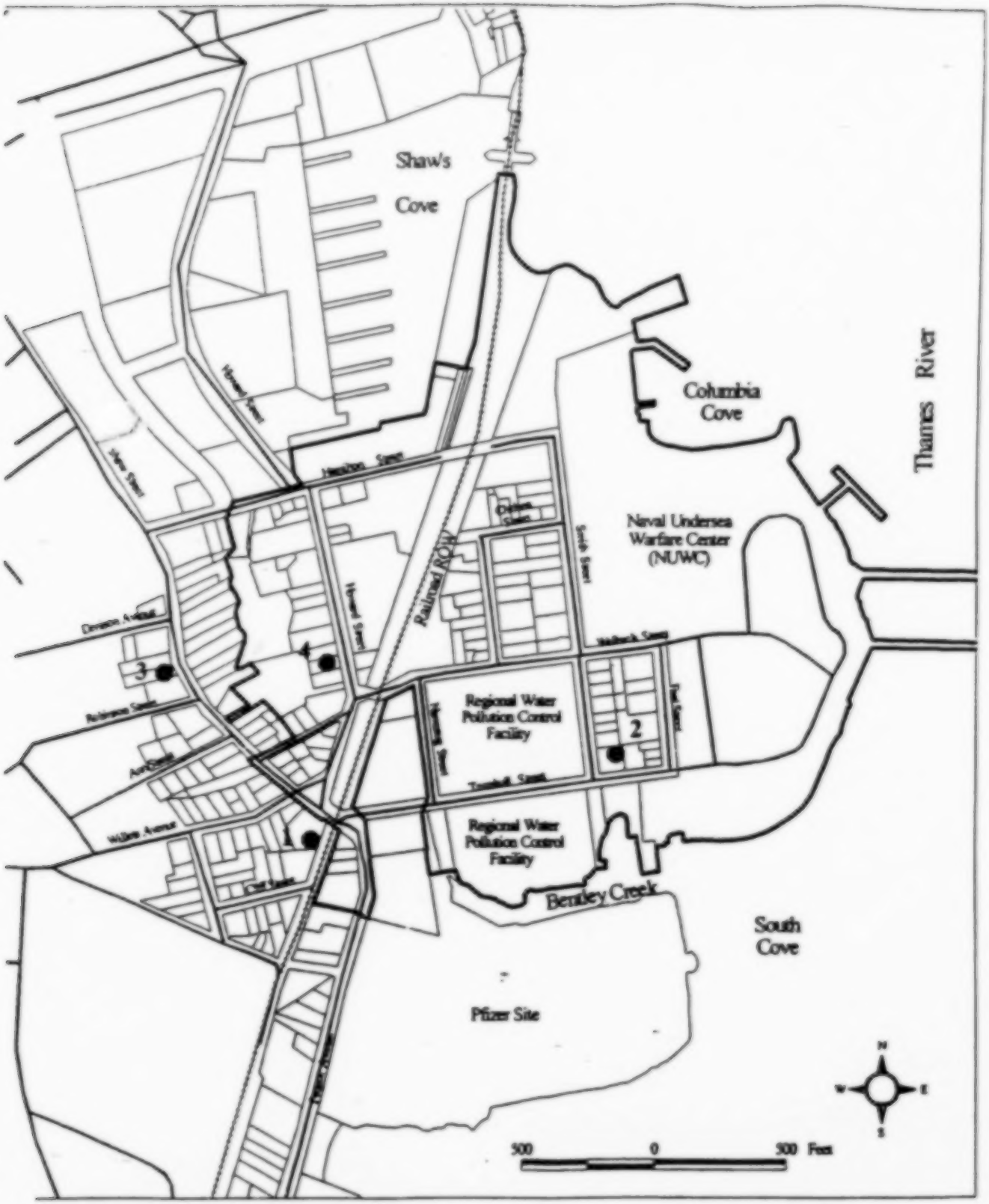
A sampling measurement program for weekdays was conducted during four time periods on October 7 and 8 and November 6, 1997. Measurements were taken five feet from the existing building walls of the receptor locations. Microphone height for all receptors was eight feet above ground level.

Measurements at each sampling location were made on the A-scale (A-weighted decibel or dBA) for a sampling period of 30 minutes. A wind screen was used to minimize wind noise across the face of the microphone. The data were digitally recorded by the noise analyzer and displayed at the end of the measurement.

The one-hour equivalent noise levels (L_{eq}) measured at sites 1 through 4 are presented in Table 2.14-2. The predominant source of noise was vehicular traffic at all measurement locations. The measured noise levels are common for residential areas, reflecting the level of vehicular traffic present. While not directly applicable, the U.S. Department of Housing and Urban Development (USHUD), the Federal Highway Administration (FHWA), and City of New London noise criteria provide a useful yardstick by which to assess the existing noise environment in the area.

- The USHUD criterion for residential land use is exceeded when the L_{dn} exceeds 65 dBA. Based on existing noise levels, the L_{dn} = 65 (day/night sound level) was exceeded at sites 1, 3, and 4.

- The FHWA criterion for Activity Category B land uses (residential, parkland, hospitals, etc.) is 67 dBA. Existing noise levels exceeded the FHWA criteria at Site 1 during the a.m. period and Site 4 during the p.m. period. At the other two sites, the existing noise levels did not exceed the FHWA criteria; however, the measured ambient levels at all receptors reflect typical suburban area noise conditions.



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Figure 2.14-1
Noise Monitoring Locations

GIS coverages developed by Milone & MacBroom, nd HMA, Inc. Sources include Connecticut DEP, f New London, FEMA, and US Navy. Intended for planning not for design use.

1● Noise Monitoring Location

MDP Project Border

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The City of New London performance standards for noise control in residential areas do not apply to noise generated by vehicular traffic.

TABLE 2.14-2
Measured Noise Levels in the Project Area

	One-Hour L_{eq} in dBA			
Time Period	**Site 1**	**Site 2**	**Site 3**	**Site 4**
A.M. Peak (7-9 am)	67	62	65	66
Midday (10am-2pm)	64	60	63	65
P.M. Peak (5pm-7pm)	66	62	66	67
Pre-Midnight (9pm-12am)	60	58	61	63
24-Hour L_{eq}	63	59	63	64
L_{dn}	66	62	66	67

Note: L_{dn} refers to day/night sound level.

2.15 Solid Waste and Hazardous Materials

2.15.1 Solid Waste

According to the Connecticut Conservation and Development Plan, Connecticut has put into place most of the components of a new system for the management of municipal solid waste. This system has largely replaced past reliance on landfills, with a new emphasis on reducing the amount of waste generated and on capturing reusable materials and energy before disposal. Waste avoidance, recycling, composting, resource recovery, and properly sited and regulated landfills constitute an integrated system for solid waste management in Connecticut.

In 1995-96, 23% of the municipal solid waste generated in the state was recycled; 60% was processed at resource recovery facilities; and 17% was landfilled. The recycling percentage is a conservative number, as it does not include data on automobiles, commercial

scrap metal recycling, and backyard composting. The state's objective is to recycle 40% of the waste stream by the year 2000 and thereafter to offset any potential growth of the waste stream by either waste avoidance or recycling. Resource recovery has been an effective method of capturing available energy from the waste stream, replace fossil fuels with a renewable fuel, and significantly reduce the volume of the waste to be disposed.

The statewide policy on solid waste is to continue the timely planning, financing, construction, and operation of a statewide, integrated recycling, composting, resource recovery, and landfill system.

The State of Connecticut passed a mandatory recycling law in 1987 that prohibits glass bottles, cans, and newspapers from being disposed of at landfills or at resource recovery facilities. This legislation was specifically designed to reduce Connecticut's solid waste stream by 25%. According to the New London Conservation and Development Plan, the city has almost achieved the 25% goal, and the recycling program continues to improve and expand. Office paper, backyard composting, and school paper recycling still have great potential for significant expansion and will continue to be the focus of the city's recycling efforts.

New London has three refuse packers and two recycling vehicles which are assigned to daily collection routes with supplemental assistance for leaves, yard waste, and commercial recycling. Private waste haulers serve many of the city's commercial properties and most of the city's large apartment and condominium complexes. Refuse collected by the city is then delivered to the Preston waste-to-energy incinerator via transfer trailers from the Transfer Station on Lewis Street. Recyclables are delivered to a private contractor in Willimantic.

2.15.2 Hazardous Materials

Hazardous wastes are defined by their corrosive, reactive, ignitable, or toxic characteristics that can potentially harm human health or the environment when improperly managed. Hazardous waste generation, treatment, storage, and disposal is regulated by the federal Resource Conservation and Recovery Act (RCRA).

According to the *Conservation and Development Policies Plan for Connecticut,* common waste streams among the state's hazardous waste generators include heavy metal-bearing sludges, used solvents, and inorganic liquids such as spent acids and caustic solutions. Connecticut generators rely on out-of-state access to disposal capacity because increased federal regulatory requirements imposed in the mid-1980's effectively ended in-surface disposal practices. Previously, industrial wastes were often directly discharged to surface impoundments adjacent to manufacturing plants or disposed in municipal landfills that accepted such wastes.

As in-state disposal options disappeared, exports of hazardous wastes rose from 42,200 tons to 121,000 tons between I983 and 1989. During the same period, generation of recurrent waste, which includes waste from ongoing production processes, declined from 188,100 tons to 127,000 tons. In addition, one-time waste generation from spill clean-ups and site. remediations in the 1980's has slowed as surface impoundments, landfill and plant closures have been completed.

New London participates in a household hazardous waste collection day each year. Prior to the designated collection day, the Public Works office mails out brochures and advertises the event on the radio and in

newspapers. Brochures are also distributed in public places such as the library. The content of the brochure and advertisements educate the public on why they should participate, what are the acceptable materials, how to package the hazardous wastes, and where to take the hazardous waste products on the designated day.

2.15.3 Applicable Environmental Regulations

The following Connecticut and Federal environmental regulations may apply, at least in part, to the Fort Trumbull MDP area:

The Connecticut Transfer Act (Connecticut General Statutes (C.G.S.) Section 22a-134 et. seq.)

The property transfer law requires certain real properties and/or businesses defined as establishments (as defined below) to disclose environmental conditions of the property upon its transfer. When an establishment is transferred, one of four forms must be executed and a copy must be filed with the Department of Environmental Protection. When there has been a release of hazardous waste, a party associated with the transfer must certify to investigate and remediate the property.

An establishment means any real property at which or any business operation from which (A) on or after November 19, 1980, there was generated, except as the result of remediation activities, more than one hundred kilograms of hazardous waste in any one month or which recycled, reclaimed, reused, stored, handled, treated, transported or disposed of hazardous waste generated by another person or municipality, or (B) the process of dry cleaning was conducted on or after May 1 1967, (C) furniture stripping was

conducted on or after May 1, 1967, or (D) a vehicle body repair shop or vehicle painting shop is or was located on or after May 1, 1967.

The Remediation Standard Regulations (C.G.S. Section 22a-134K-1 to 3)

The Connecticut Remediation Standard Regulations (RSR), effective on January 30, 1996, are used to determine whether sufficient remediation has been conducted at sites which have been required to be cleaned up by statute regulation or administrative order (C.G.S. Chapter 445 or 446K). The RSRs also apply to properties undergoing remediation pursuant to voluntary remediation (C.G.S. Sections 22a-133X and 22a-133Y). The regulations provide baseline numeric criteria (standards) for soil, ground water and surface water that may be used to determine whether remediation is necessary. Remediation standards for soils and ground water are based in part on current and future land uses, often allowing a less restrictive standard in non-residential settings. Alternatives, exceptions, and variances to these criteria are available under certain circumstances, and the opportunity exists for self-implementation of such alternatives. The regulations are applied where the site has been properly characterized, which includes a representative sampling program of the environmental media. The overall goal of the RSRs is to protect human health, public welfare, and the environment.

Regulations for Underground Storage of Oil and Petroleum Liquids (C.G.S. Section 22a-449(d)-1)

These regulations apply to any non-residential underground tank that stores petroleum and petroleum products. The "UST system" includes the tank,

piping, underground ancillary equipment, and containment system. If greater than 10% of the system is below ground, then it is considered underground. The regulations generally have the following provisions: performance standards; notification requirements; operating requirements such as spill control, corrosion protection, reporting and record keeping; release details, reporting, investigations, corrective action; closure; financial responsibility; upgrading; life expectancy; removal; and transfers. There are specific requirements and exemptions for certain systems.

Spill Reporting Requirements (C.G.S. Section 22a-450)

These statutes require that whenever there is a discharge, spill, uncontrolled loss, seepage or filtration of contaminants that poses a potential threat to human health or the environment from any ship, boat, barge, or other vessel, or from a terminal, establishment, vehicle, trailer, or other machine, the Commissioner shall be immediately notified. The statute mandates the reporting of "such facts as the Commissioner by regulation may require," but also provides minimum components of such a report. Spills also include leaks from underground and above-ground tanks. The party that caused the spill and the property owner are responsible to contain the spill immediately.

Superlien (C.G.S. Section 22a-452a(a))

On or after June 3, 1985, any amount paid by the Commissioner pursuant to Section 22a-451(b) of the statutes to mitigate the effects of a spill may be recovered by the DEP through a "Superlien." Superlien takes its name from the superior nature of the encumbrance, since the lien "shall take precedence over

all transfers and encumbrances recorded on or after June 3, 1985, in any manner affecting such interest in such real estate."

Avoiding the lien by selling off contaminated parcels of real estate will not relieve the owner from the provisions of the statute, since the lien applies to "real estate which has been included, within the preceding three years, in the property description of such real estate and is contiguous to such real estate. Amendments to the statute, however, restrict the lien to "the real estate on which the spill occurred or from which it emanated." The Commissioner must first expend money or resources to create the lien.

There are certain exemptions, including residential real estate, a mortgage acquiring title by foreclosure, or a deed in lieu of foreclosure and certain transfer act filings.

The National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61, Part M

Although EPA Asbestos Regulations generally apply only to schools and training facilities, they are extended to the private sector through the National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61, Part M). NESHAP regulates the application, removal, and disposal of asbestos containing materials. NESHAP requires abatement of asbestos containing material prior to demolition or renovation activities, and assigns responsibility to owners/operators.

The Resource Conservation and Recovery Act (RCRA)

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 and provided the U.S.

Environmental Protection Agency (EPA) with the authority to issue and enforce rules governing hazardous waste management. The first set of hazardous waste regulations were published on May 19, 1980, and went into effect on November 19, 1980.

The primary objective of the RCRA is to protect human health and the environment from the mismanagement of hazardous waste. To achieve this objective, EPA has developed a comprehensive "cradle-to-grave" system which regulates the generation, transportation, storage, treatment, and disposal of hazardous waste.

The specific RCRA requirements that apply to a facility are dependent primarily on their hazardous waste generation rate, on-site storage frequency and treatment/disposal operations. Listed below are typical RCRA requirements for facilities that generate small volumes of hazardous wastes.

- Hazardous waste determinations
- Manifests for all wastes
- Regularly scheduled inspections of wastes and waste areas
- Container management
- Contingency planning
- Training of requisite personnel
- Record keeping requirements

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), which is commonly

known as "Superfund" was enacted on December 11, 1980. The primary purposes of the 1980 act were to: (1) provide funding and enforçement authority for the cleanup of old hazardous waste sites (prior to 1980); and (2) provide response to hazardous waste spills. After 1980, sites were to be covered by the RCRA Program. Due to the problems associated with the 1980 Act, CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The new provisions added by SARA included:

- Preference for remedies that incorporate permanent treatment or destruction of wastes
- Codifying existing cleanup standards and expansion to include the application of state standards
- Increased opportunities for state and citizen involvement
- Expansion of removal authorities
- Focus on public health
- Increased focus on research and training
- Special attention to the roles and requirements of other federal agencies
- New enforcement authorities and procedures
- Requirements for community and state preparedness
- Requirements for implementation of corrective actions for underground storage tanks

Under CERCLA, EPA has the authority to respond to releases or to threat of releases of hazardous substances that pose an imminent and substantial threat to the public health or to the environment. To address

a release or threat of a release, EPA has the following two options:

1. Take direct action and administer the cleanup work and then sue the responsible parties to recover the cost. Under this option, the responsible parties are given a chance to assign responsibility for the cleanup.

2. Issue orders or sue the responsible parties in a civil suit to force them to clean up the site themselves.

The Connecticut Lead Poisoning Prevention and Control Regulations (C.G.S. Sections 19a-111-1 through 19a-111-11)

These regulations apply to residential properties (including apartment units and complexes) where a child under the age of six resides; and for child day-care centers, group day-care homes, and family day-care homes. For a residential property with a child present, defective lead-based paint surfaces in the dwelling unit, exterior areas, and common areas must be abated. If a lead-poisoned child is present on the property, then lead based chewable surfaces must also be abated, whether or not the surface is defective. Intact surfaces which are lead-based require a lead management plan if a child resides on the property. Interior dust and exterior soil shall be assessed if a child resides in a dwelling requiring lead abatement, and shall be abated if found to be a source or potential source of elevated blood lead to a child. These regulations specify the approved methodologies for conducting lead paint inspections by state licensed inspectors and approved methods for lead paint abatement which must be conducted by licensed abatement contractors, when required.

The Residential Lead Based Paint Hazard Reduction Act of 1992 (known as Title X)

Title X applies to most residential structures built before 1978 (target housing). It requires property owners who are renting or selling target residential housing to disclose all known lead-based paint and lead-based hazards in the housing and provide any available reports on lead, provide an EPA/HUD pamphlet on lead, include certain warning language in the lease/contract as well as signed verification statements from all parties, retain signed acknowledgements for 3 years verifying compliance, and for sales only, give buyers a 10-day opportunity to test for lead.

Agents in a real estate transaction involving target housing must ensure that sellers/landlords are made aware of their obligations, ensure that sellers/landlords disclose the proper information to buyers/tenants, ensure that sellers give purchasers the opportunity to conduct an inspection, and ensure that lease and sales contracts contain the appropriate notification and disclosure language and proper signatures. Title X does not require that an inspection take place before a sale transaction, only that the opportunity be given. Also, abatement is not required under Title X if lead-based paint or other hazards are identified from an inspection.

Guidance for Disposal of Building Materials Coated with Lead Based Paint

The CT Department of Environmental Protection (DEP) has prepared a November 4, 1994 (revised October 18, 1996) guidance document entitled "*Guidance for the Management and Disposal of Lead Contaminated Materials Generated in the Lead Abatement, Renovation, and Demolition Industries.*" Activities

which the document covers include renovation activities and whole house demolition. The document suggests that any lead removal begin with proper characterization, and seven different strategies for sampling and characterization are provided. This includes strategies which initially make use of a portable x-ray fluorescent (XRF) instrument and strategies which involve the selection of representative samples of the material to be disposed for analysis for lead via the toxicity characteristic leaching procedure (TCLP) analysis. Once the material to be disposed is classified, then an appropriate disposal option can be selected.

2.15.4 Potential Environmental Contamination in the Project Area

A preliminary evaluation of the potential for environmental contamination of properties within the MDP has been performed. Current and historical land uses have been reviewed, Connecticut Department of Environmental Protection files have been searched, and federal environmental databases have been examined. Appendix E presents a summary of the findings of the property reviews. A high, medium, or low risk categorization has been assigned to each property in the MDP area.

- High risk properties are current or former manufacturing operations, documented underground tank sites, or high risk commercial activities such as gasoline stations, auto body, painting shops, and the like.
- Medium risk properties are current or former commercial operations which may have utilized chemical or petroleum products or residential properties with underground storage tanks;

- Low risk parcels are benign commercial or residential properties (without underground tanks) and no reported history of waste generation or releases.

Figure 2.15-1 presents the risk classifications of properties in the MDP area. Of the 115 properties reviewed, twenty-six (26) have been characterized as High Risk, twelve (12) as Medium Risk, and the remaining seventy-seven (77) as Low Risk

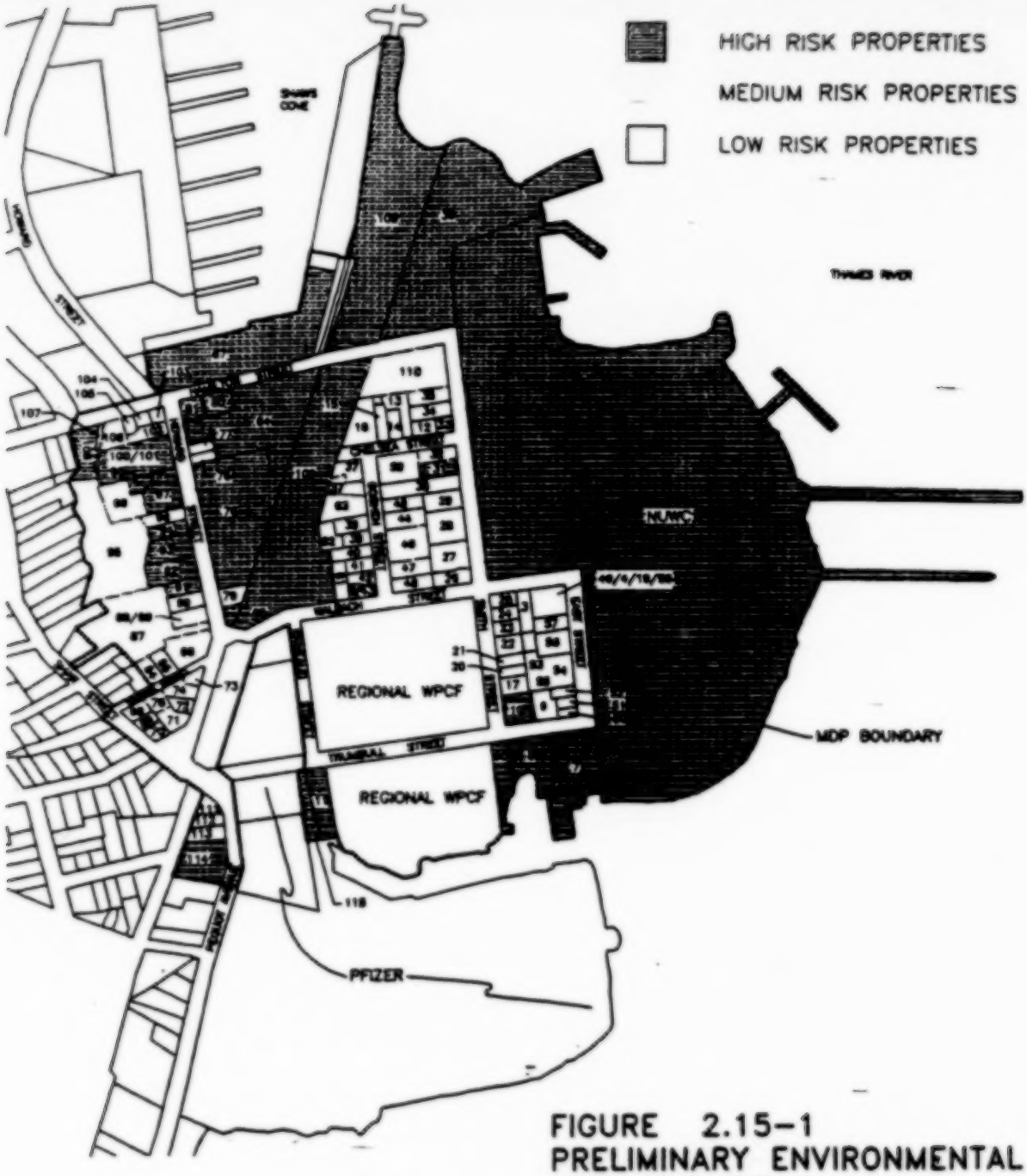


FIGURE 2.15-1
PRELIMINARY ENVIRONMENTAL
RISK RATINGS
FORT TRUMBULL MDP AREA
NEW LONDON, CT.
DRAFT ENVIRONMENTAL IMPACT
EVALUATION NOVEMBER 1998
HRP #NEW2900.P1

NEW290P1\PARCELS (M)

3.0 ALTERNATIVES CONSIDERED

3.1 Overview

Prior to evaluating alternatives for the Fort Trumbull MDP area, an extensive environmental inventory was conducted, as presented in Section 2.0 of this document. Review of existing conditions and pertinent policies and programs which could affect future implementation of the MDP were also evaluated prior to completion of the alternatives analysis.

Certain uses were identified early on as being incompatible with the project area and/or local or statewide planning policies and were, therefore, not pursued. Included among these uses were the following:

Floating Hotel / Floating Restaurant – Although these uses are attractive waterfront uses and have the potential to bring in large numbers of both tourists and the local community, they have been reviewed unfavorably by the Department of Environmental Protection (DEP). DEP does not consider floating hotels and restaurants as public access amenities, and these types of uses have not been viewed by the DEP and others as being water-dependent uses. Major concerns have been raised about permanently utilizing public trust land and waterways of the state for the sole purpose of economic gain. Accordingly, these uses were not pursued.

Shopping Mall – There are numerous issues associated with locating a major shopping mall in the Fort Trumbull area. This type of use is not water dependent and would be better located at an inland location. Large volumes of traffic would likely be generated to and from such a facility, particularly during peak weekend and holiday periods. This use is not consistent with existing nearby development, the planned clinical research facility by Pfizer, or with a state

park. Such a use would likely pull the focus away from downtown New London and potentially displace uses which currently occur there. For these and other relevant reasons, a shopping mall was not considered.

Heavy Manufacturing/Industrial Uses – It is recognized that any future reuse or redevelopment of the Fort Trumbull area must be consistent with floodplain policies and regulations. Heavy manufacturing generally requires intensive ground floor use for operation and storage of heavy equipment. Heavy truck traffic associated with deliveries and shipping are also common in industrial uses. Although site access and roadway network improvements are proposed, the Fort Trumbull area is not particularly well suited for heavy manufacturing or industrial uses. Barge and boat access is attractive for certain types of operations, however, proximity to the waterfront is not required for many manufacturing and industrial applications. For these reasons, heavy manufacturing and/or industrial uses were not considered in the alternatives analysis.

Ferry Terminal – Previous land use concept analysis of the Fort Trumbull area evaluated development of a high speed ferry terminal along the Thames River at the NUWC property. Since that time, numerous projects have been planned in the downtown New London area which will offer these same types of services. Additional ferry operations would duplicate services which are currently, or in the near future will be, provided in the downtown New London area. Therefore, a ferry terminal was not considered as part of the land use alternatives analysis. It is, however, included as part of the No Action alternative for reasons described in Section 3.2.

In an effort to responsibly pursue alternatives, few options were ruled out in the evaluation of a broad

range of diverse alternatives. At the same time, it is possible that certain aspects may not meet the test of consistency with state and local planning policies, identified project goals and objectives, economic viability, environmental impacts, or compatibility with existing physical and environmental site conditions. These issues are fully evaluated in Section 4.0 of this document.

The following broad land use categories were considered as part of the land use concept alternatives analysis:

Educational/Cultural
Nautical Education
Culinary/Hospitality
Museums
Wetlands Education

Recreation
Athletic Fields/Faculties
Indoor Athletic
Harbor Walk/Promenade
Boat/Sail Center
Boat Launch
Day Boat/Sport Fishing
State Park Extension
Botanical Garden

Marina
Conventional
Transient
Teaching

Transportation
Water Taxi
Hydrofoil Mooring
Parking

Housing
Adult Living
Residential (Single and Multi)
Rehabilitation

Commercial/Industrial
Office
Retail/Professional Services
Incubator/Commercializer
Flex Space
Fishing Related
Hotel/Lodging
Restaurants

Light Industrial
Warehousing
Fish Processing

In addition to minimizing environmental impacts, alternatives were measured against the identified project goals and objectives. These goals have been carried through the development and evaluation of alternatives. They are:

1. To create a world-class development that will complement the undertakings of Pfizer, Inc. and set a standard for development in New London.
2. To create an economic asset for the City of New London that will create jobs, generate tax revenue, and result in spin-off economic activity.
3. To maximize public access to the waterfront and, in doing so, encourage uses which are water dependent or which will be enhanced by water access and views.
4. To develop a project which will help build momentum for the revitalization of downtown New London and the balance of the city to the benefit of the city's residents and visitors.

It is understood that not all of the alternatives will meet all of these goals and objectives. Each alternative is measured against them in Section 4.0 of this document.

3.2 Land Use Concept Alternatives

The organizational structure of the discussion of alternatives is as follows: Section 3.2.1 presents a brief overview of alternatives and fixed program elements. Section 3.2.2 presents program elements that are common to Alternatives 2 through 6. Section 3.2.3 presents roadway improvement options which are also common to Alternatives 2 through 6. Sections 3.2.4 through 3.2.9 present detailed descriptions of the six alternatives.

3.2.1 Overview of Alternatives and Fixed Program Elements

Overview of Alternatives

A series of six general land use alternatives have been developed based upon input from project consultant team members, city and state officials, and public input at various neighborhood meetings. The intent was to examine a broad range of likely land use combinations which could occur in the project area as described in Section 3.1. Broad categories include educational/cultural uses, recreation (including the proposed state park), marina, transportation, residential housing, commercial (retail and office space), and light industrial.

Alternatives were developed based upon the requirement to evaluate no action, an interest in possibly expanding the state park to include the entire NUWC property, and to examine residential and commercial land uses. The six alternatives are referenced as follows:

- Alternative No. 1 – No Action
- Alternative No. 2 – Recreation/Tourism
- Alternative No. 3 – Residential/Commercial
- Alternative No. 4 – Business Campus
- Alternative No. 5 – Mixed Use 1
- Alternative No. 6 – Mixed Use 2

A brief description of the six alternatives follows, with more detailed descriptions in the ensuing text. The proposed state park and many of the waterfront uses that are common to most alternatives are described in Section 3.2.2.

Alternative 1 – No Action – One of the requirements of CEPA is to evaluate a no action alternative. In this particular instance, no action is somewhat unusual in that other activities and plans would likely proceed even if there were no MDP action.

Under the no action scenario, it is assumed that the Navy would proceed with disposition of the NUWC property as planned prior to the introduction of the MDP process, in accordance with the approved Local Reuse Authority's (LRA) preferred plan. On April 17, 1997 two plans (the *Redevelopment Strategy* and the *Implementation Strategy*) were published for the NUWC property. These documents were developed by Economics Research Associates (ERA) and Sasaki Associates, Inc. under contract to the City of New London. Based on the work by ERA and Sasaki Associates, Inc., a preferred plan was selected by the LRA.

The LRA's preferred plan indicated disposition of the NUWC property through conveyance of the southern portion to the Department of Environmental Protection for future development of a state park, public benefit conveyance of a portion of the property near Columbia Cove for maritime uses, with the remaining area to be publicly sold. The Plan includes development of almost 380,000 square feet of office space for research and development incubator uses, resulting in some 950 to 1,520 direct jobs, as well as an additional $270,000 in property tax revenue. Details of the LRA plan and no action alternative are presented in Section 3.2.4.

Alternative 2 – Recreation/Tourism – This alternative capitalizes and expands upon the proposed Fort Trumbull State Park, concentrating recreational, educational, and cultural uses east of the railroad in the

Fort Area and at NUWC. Office and retail uses are proposed west of the railroad in the Gateway Area.

Alternative 3 – Residential/Commercial – This alternative highlights a residential component throughout the MDP area, intermixed with the state park and open space recreational areas, and minor amounts of office and retail uses proposed in the Gateway Area.

Alternative 4 – Business Campus – This alternative focuses the majority of land use in the form of office campus and a supporting hotel/conference center, with small amounts of retail and residential uses in the Gateway Area.

Alternatives 5 & 6 – Mixed Use 1 & 2 – These two mixed use alternatives incorporate recreational, residential, commercial office, retail, and hotel/conference uses in different proportions and arrangements.

The six land use alternatives are shown graphically in Figures 3.2-1 through 3.2-6. These plans represent general land use areas and density of development. They are not intended to be exact geographic limits or configurations. A preferred alternative has not been selected and it is anticipated that the ultimate selected preferred plan may be a hybrid of several alternatives.

The land use concepts are shown graphically as more or less conforming to existing roadway patterns. Some roadway locations are fixed by the shoreline, bridges, boundaries, and topography. However, it is not the intent to stick rigidly to this roadway network. A design level refinement will be presented in the MDP which follows the CEPA process. A required public hearing and local approval process will be adhered to during adoption of the MDP.

Fixed Program Elements

Certain elements are common to all six alternatives. A description of each follows:

State Park – The adopted LRA reuse plan identified a portion of the Naval Undersea Warfare Center (NUWC) around the historic fort to be used for open space and recreation. Following adoption of the reuse plan, the State of Connecticut chose to acquire part of the NUWC property to create a new state park. The proposed amount of state park land is larger than that identified for open space and recreation in the reuse plan. Based on the Fort Trumbull State Park Feasibility Report (June 18, 1997 and amended December 1997), the new park will be 16 acres and includes nearly the entire southern half of the NUWC property, including Piers 4 and 7. The park is depicted in this way on all alternatives, except on Alternative 2 where it is shown as a larger area (30± acres) for reasons noted in the description for this alternative.

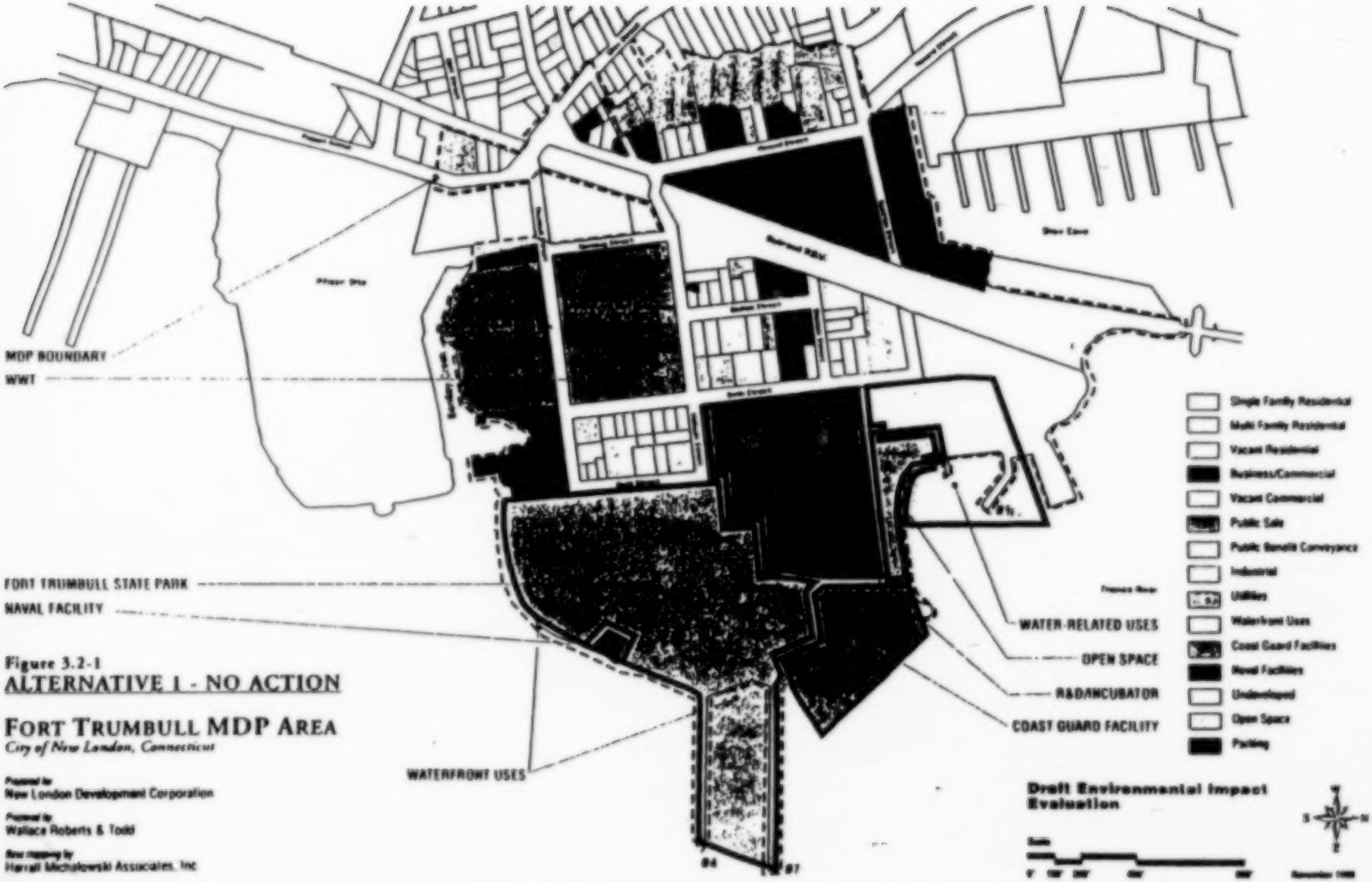


Figure 3.2-1
ALTERNATIVE 1 - NO ACTION

FORT TRUMBULL MDP AREA
City of New London, Connecticut

Prepared for
New London Development Corporation

Prepared by
Wallace Roberts & Todd

Base mapping by
Harrall Michalowski Associates, Inc

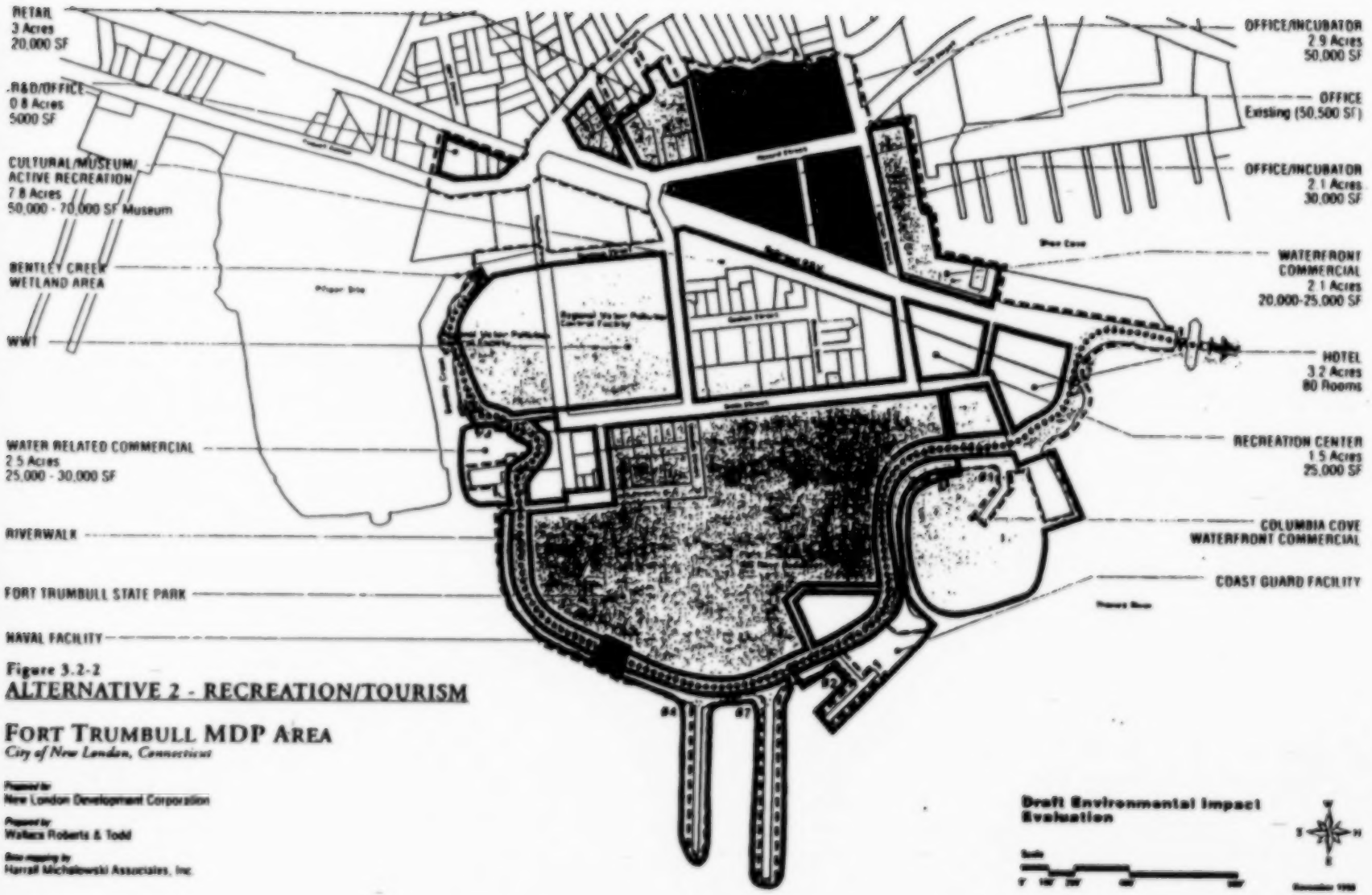


Figure 3.2-2
ALTERNATIVE 2 - RECREATION/TOURISM

FORT TRUMBULL MDP AREA
City of New London, Connecticut

Prepared for:
New London Development Corporation

Prepared by:
Wallace Roberts & Todd

Base mapping by:
Harrall Michalowski Associates, Inc.

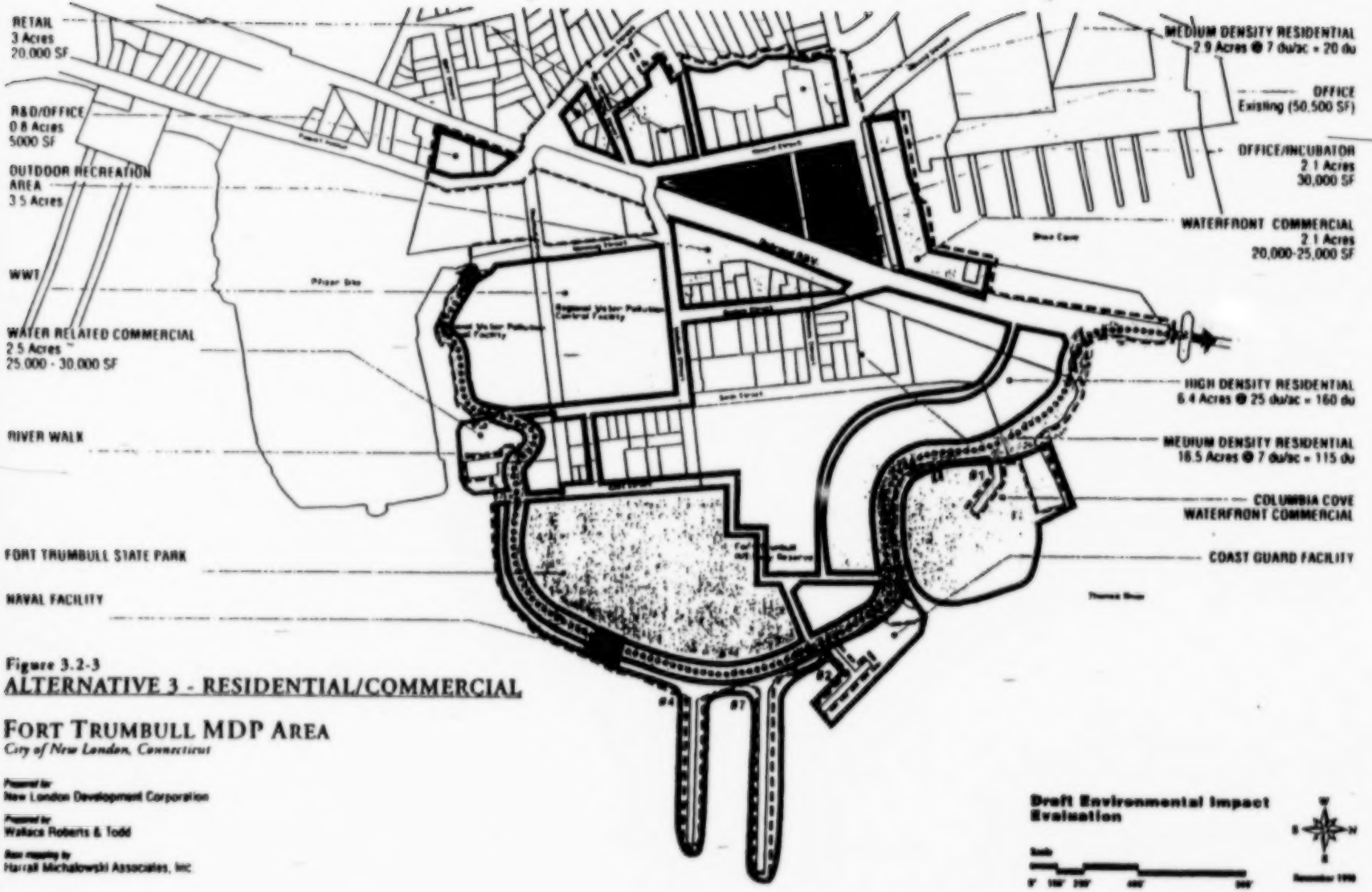


Figure 3.2-3
ALTERNATIVE 3 - RESIDENTIAL/COMMERCIAL

FORT TRUMBULL MDP AREA
City of New London, Connecticut

Prepared for
New London Development Corporation

Prepared by
Wallace Roberts & Todd

Base mapping by
Harrall Michalowski Associates, Inc.

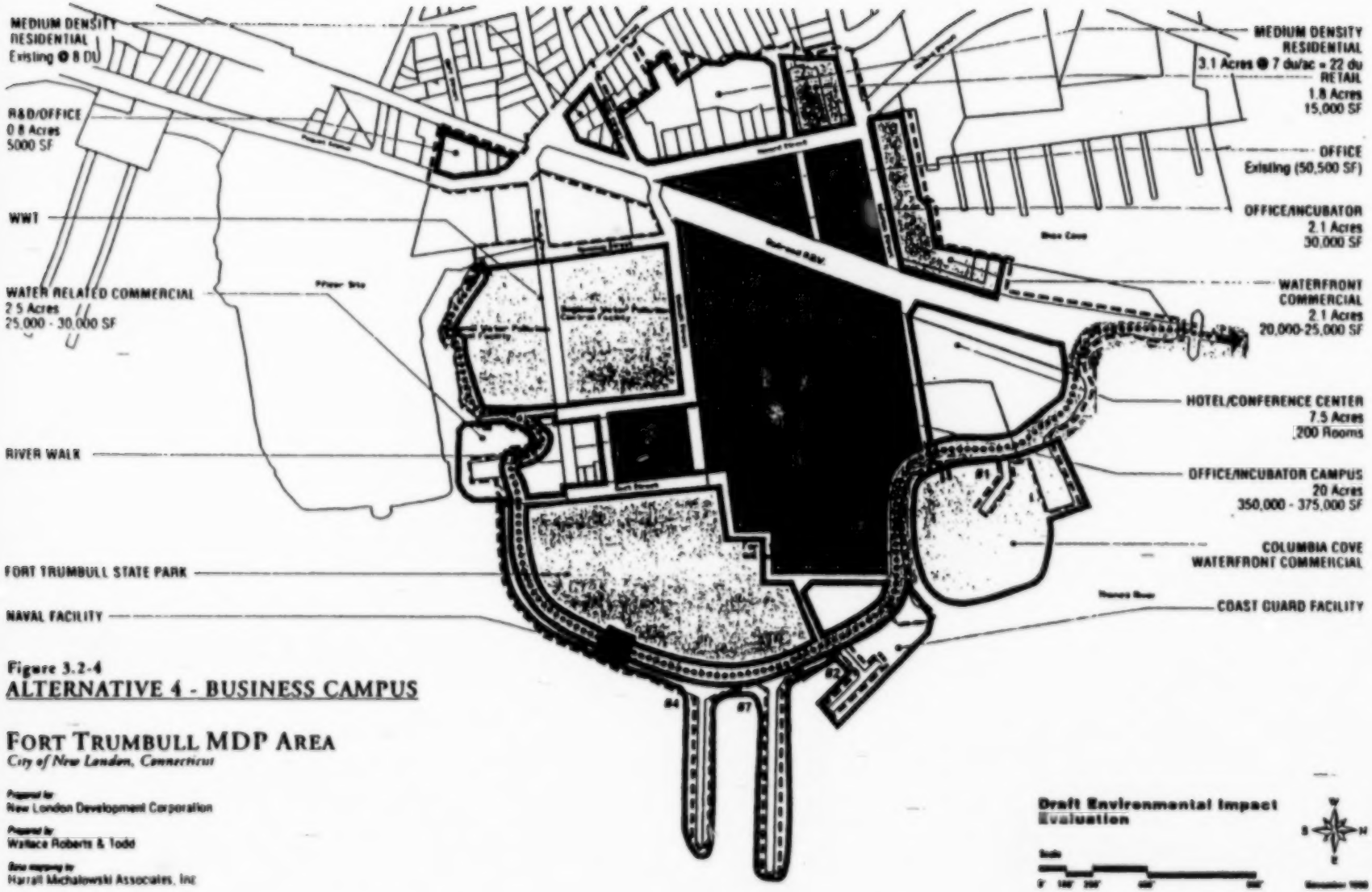


Figure 3.2-4
ALTERNATIVE 4 - BUSINESS CAMPUS

FORT TRUMBULL MDP AREA
City of New London, Connecticut

Prepared for
New London Development Corporation

Prepared by
Wallace Roberts & Todd

Base mapping by
Harrall Michalowski Associates, Inc

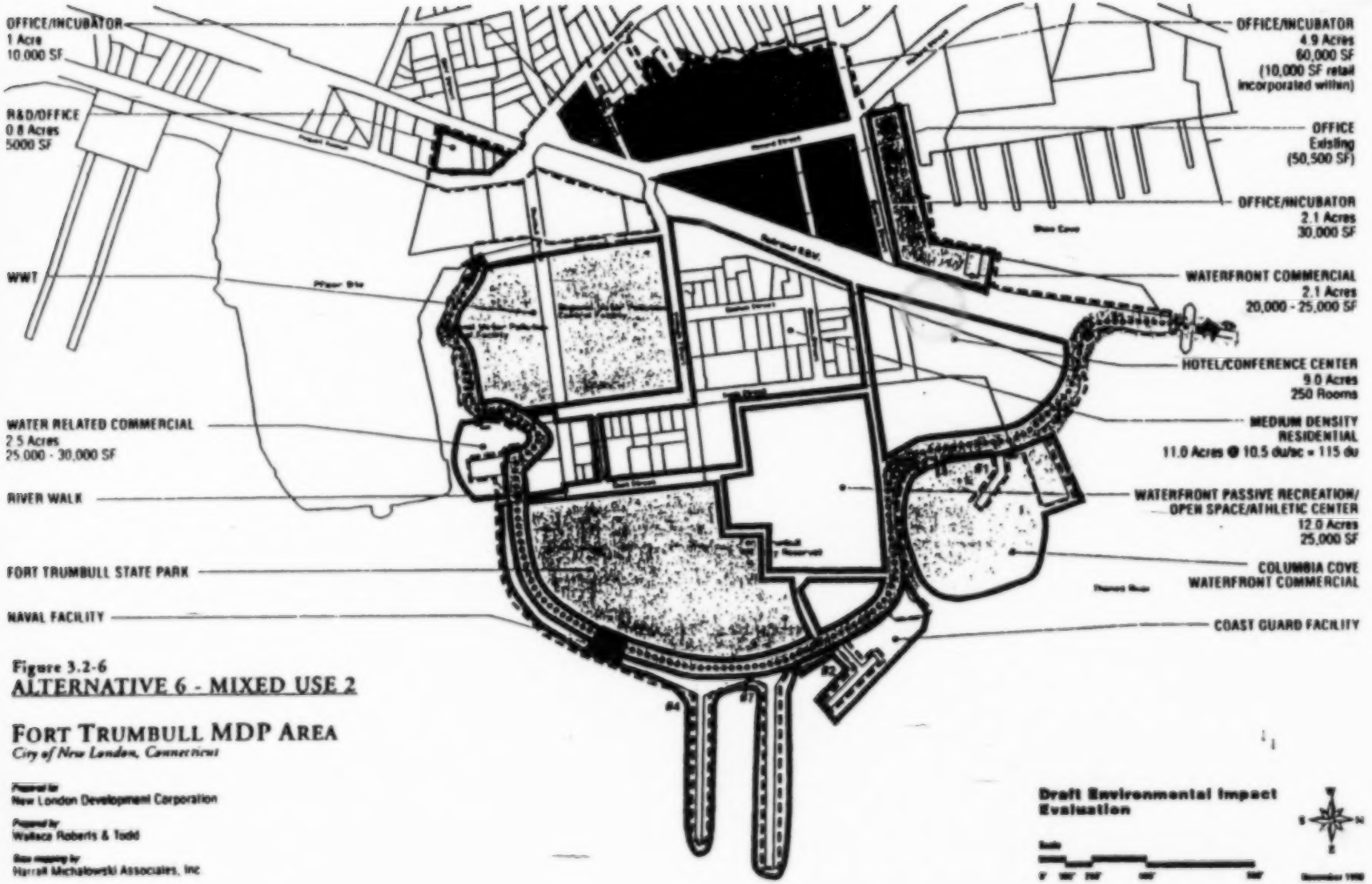


Figure 3.2-6
ALTERNATIVE 6 - MIXED USE 2

FORT TRUMBULL MDP AREA
City of New London, Connecticut

Prepared for
New London Development Corporation

Prepared by
Wallace Roberts & Todd

Base mapping by
Harrall Michalowski Associates, Inc

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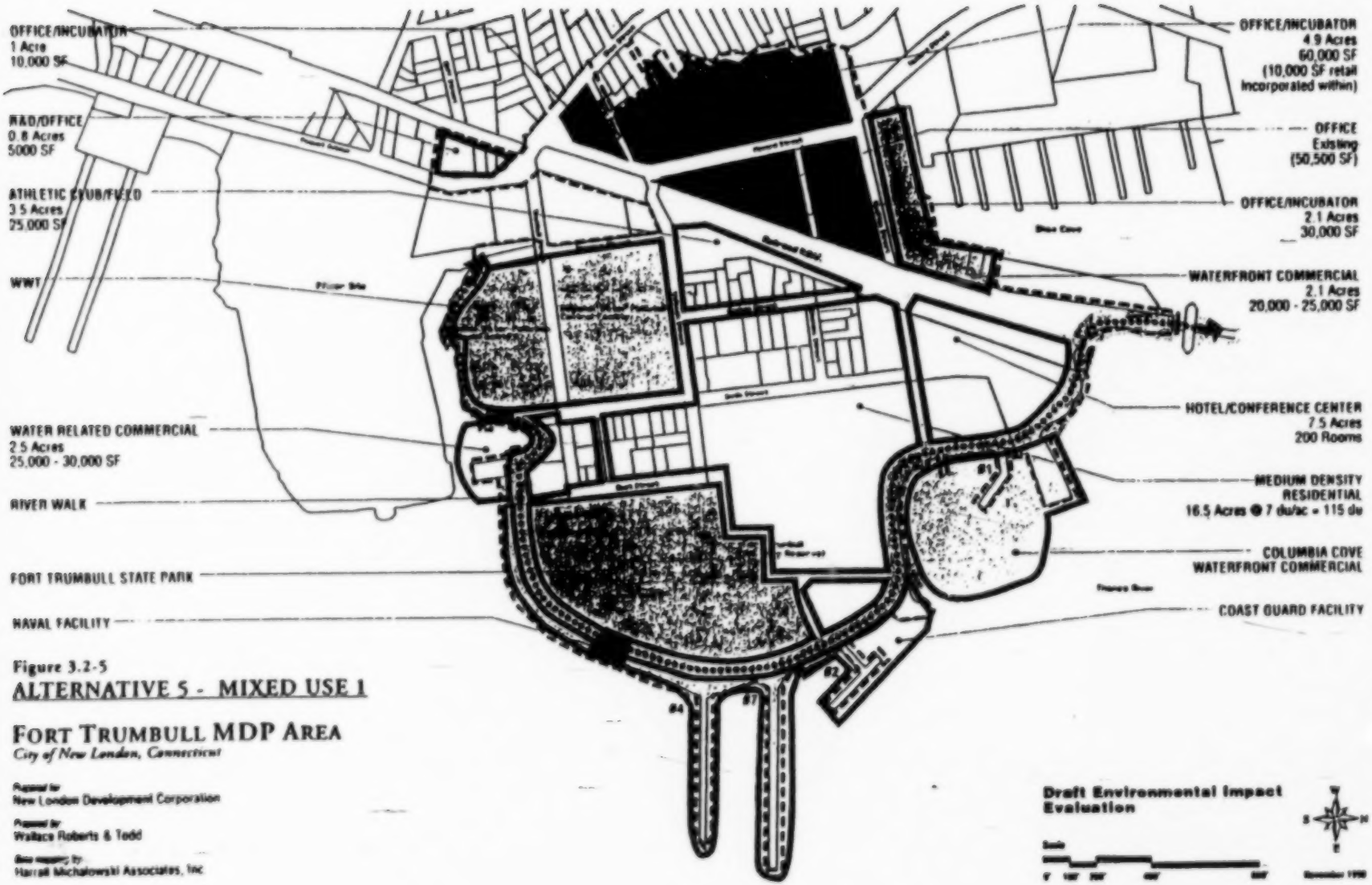


Figure 3.2-5
ALTERNATIVE 5 - MIXED USE 1

FORT TRUMBULL MDP AREA
City of New London, Connecticut

Prepared for
New London Development Corporation

Prepared by
Wallace Roberts & Todd

Base mapping by
Harrall Michalowski Associates, Inc

Based on information contained in the Draft Application to the Federal Lands to Parks Program from the Department of Environmental Protection, the park would provide a scenic overlook of the Thames River, passive open space, fishing, boating. picnicking, tours of historic Fort Trumbull, and interpretive programs of the military history of the site over the past 200 years.

Piers 4 and 7 are integral components in the plans for Fort Trumbull State Park. Both piers are located on the eastern boundary of the property, each extending approximately 150 feet. Pier 4 would serve the park as a public fishing pier. The lower Thames River is a rich and diverse fishery resource. The strategic location of Pier 4 would provide anglers, who do not own boats, the opportunity to fish the Thames River at a key access point. Pier 4 would also serve as a primary docking location for DEP's Marine Boating Law Enforcement Division, in monitoring boat traffic on the Thames River.

Pier 7 was historically used by the Navy to occasionally moor submarines, and by the U.S. Coast Guard to dock large patrol boats and the barque Eagle. Future planned use of this pier will be for dockage of public recreational boats and tour/excursion boats, providing visitors access to Fort Trumbull State Park by water. In the year 2000, "Operation Sail" will be visiting New London with 24 tall ships. The piers would afford dockage for several of these ships for public display and visitation.

Coast Guard – The Coast Guard will retain use of an area of approximately 1.5 acres along the Thames River adjacent to Fort Trumbull State Park. This use area will include Buildings 45, 86 and 12 (15,000± square feet) and Piers 2 and 6.

Navy – The Navy will retain use of one of its facilities (Building 109) along the river's edge and approximately 0.1 acre of land adjacent to it.

Regional Water Pollution Control Facility – This facility is shown at its current location with no change in land requirements. This facility has been located along the Thames River since 1929. Feasibility studies are underway to upgrade the facility to improve the level of treatment and to implement odor control and aesthetic improvements. No land use or zoning changes are proposed.

3.2.2 Program Elements Common to Alternatives 2 Through 6

The following elements are common to the five action alternatives. A description of each follows:

Riverfront Walkway – A continuous, public walkway is proposed along the water's edge, extending from Bentley Creek to the Amtrak bridge over Shaw's Cove. This feature was adopted in all five action alternatives in an effort to incorporate a strong public access component in the project and to link the state park with the surrounding area. One of the critical features of the riverfront walkway is the linkage to downtown New London via a proposed pedestrian bridge at the Amtrak railroad crossing at the entrance to Shaw's Cove. If this linkage is determined to be infeasible, due to railroad operations or requirements, an alternative inland route would be developed to create this linkage.

Public access amenities along various portions of the walkway could include a small boat launch area. This component is further intended to implement and be consistent with the Connecticut Coastal Management Act (CCMA) policies and guidelines.

Columbia Cove Waterfront Commercial Use – The land and water in this area are planned for waterfront commercial development and it is anticipated to be a mix of uses. This area is currently occupied in part by New London Seafood Distributors. Ongoing water-dependent uses are proposed under all alternatives, either as rehabilitated existing facilities or new water-dependent facilities. Among the potential new uses is a marina (80 to 100 slips) for docking recreational boats, with onshore support to be constructed in the immediate area. Parking would be provided nearby in dedicated and shared parking spaces. Other options include a smaller transient dockage area or a kayak launching area. The issue of water dependency under the CCMA would need to be addressed for the specific use or uses in this area.

Water-Related Commercial Uses – The existing Fort Trumbull Marina and adjacent land are shown for reuse as water-related commercial to include up to 30,000 square feet. Similar to the Columbia Cove area, ongoing water-dependent uses are proposed for the Fort Trumbull Marina area under all alternatives, either as rehabilitated existing facilities or new water-dependent facilities. Potential new uses are expected to range from a marina training facility and marina (40 to 50 slips) to marine commercial/retail. A marina training facility could provide education and outreach opportunities in areas such as marina management and marine and coastal management which would integrate with Pfizer's preliminary plans for a nature/educational walk associated with the tidal wetland area near Bentley Creek. Commercial/retail uses are anticipated to be water dependent or incorporate water-dependent aspects. Water dependency and consistency with CCMA would need to be addressed for the specific use or uses in this area.

Pequot Avenue Area – The area of land west of Pequot Avenue and south of Trumbull Street of approximately one acre in size is identified for R&D/ Office use it is expected to be used for expansion or support space for the new 800,000 square foot Pfizer facility to be constructed immediately east of Pequot Avenue. the site has an estimated development capacity of approximately 5,000 square feet of this type of use, assuming elevated structures and parking beneath for the maximum yield.

Gateway Area – No changes are proposed to the existing office building located at 194 Howard Street. This is a three-story 50,500 square foot structure with 152 associated parking spaces. This building is elevated above the 100-year flood elevation. The parcel north of it (at the corner of Howard Street and Hamilton Street) is shown as office/incubator use. It is a 2.1-acre site with capacity for 30,000 square feet of space and 90 parking spaces. This building, and all others within the floodplain, will be designed and built to conform to State of Connecticut and FEMA standards.

Shaw's Cove Area – The area west of the railroad tracks (2.1 acres) is currently occupied by the Miner and Alexander Marine Lumber Yard. This area is proposed as waterfront commercial uses, either as rehabilitated existing facilities or new water-dependent facilities similar to the types present. It is estimated that there could be a total of approximately 5,000 square feet accommodated in two to three businesses with 60 to 75 parking spaces, depending on the type of commercial use.

Utility Improvements – Utility improvements will be necessary under all of the action alternatives. This work is anticipated to be conducted within existing or future roadway right-of-ways and not impact adjacent land uses. Under all land use alternatives, the existing

storm drainage system will need to be modified to accommodate new roadway alignments and, improvements and to correct deficiencies in the existing system. The storm drainage systems will incorporate stormwater quality renovation elements such as inlet chambers *(Vortechnics* or *Stormceptors)* and/or infiltration systems to meet the stormwater general permit requirements. Maintenance of these systems treating roadway runoff would be carried out by the city, whereas systems treating private development would be maintained by the owner.

Roadway and Traffic Improvements – Traffic and roadway improvements will be necessary under all of the action alternatives, Various concepts have been evaluated and are presented in Section 3.2.3 of this document.

3.2.3 Roadway Improvement Alternatives

Adequate and safe vehicular access to the sites that comprise the Fort Trumbull MDP area is a principal consideration for a successful municipal development program. Traffic improvements will be necessary to increase the capacity of local streets to accommodate projected traffic volumes that will be generated by the land use alternatives.

Of particular concern is the ability to improve vehicular access to the peninsula (i.e. coastal areas of the MDP that lie east of the Amtrak rail corridor) where existing access points are limited and deficient. Specifically, the two existing underpasses that carry traffic beneath the Amtrak rail lines at Walbach Street and Pequot Avenue are (1) quite old and in need of maintenance, if not replacement; (2) have road beds that lie below the flood elevations; (3) have inadequate vertical clearances that prohibit the passage of

certain trucks and buses; and (4) have limited horizontal clearances that restrict the width and number of travel lanes, reduce the line of sight, and limit the ability to provide bike lanes or sidewalks at both sides of the street.

Roadway improvement objectives are as follows:

1. to create an attractive "gateway" that will provide a commanding entrance to Pfizer's new campus, the proposed Fort Trumbull State Park, and the municipal development area.

2. to improve existing and projected traffic flows from the proposed Pfizer facility, the proposed State Park at Fort Trumbull, the proposed reuse of the remainder of the NUWC site, potential commercial, industrial, and/or residential development in the Fort Trumbull MDP area, and current and future through-traffic serving other city neighborhoods;

3. to improve public safety by correcting or mitigating existing flooding problems at the underpasses in order to maintain access to the peninsula during minor storms events (to be accomplished with increased storm sewer capacity and/or pump stations); and

4. to improve the ability to provide efficient and safe evacuation of the peninsula in the event of a major storm event.

Accordingly, a preliminary study was conducted to determine how best to achieve the aforementioned goals considering economic, physical, and operational feasibility issues. This task is complicated by the need to maintain vehicular access to the area during construction, the need to maintain uninterrupted rail service on Amtrak's Northeast Corridor line, the

restricted ability to change the vertical and horizontal alignment of the Amtrak rail lines, and the shallow location of major sanitary sewer trunk lines that lead to the region's wastewater treatment facility on Trumbull Street.

Three possible roadway improvement alternatives have been evaluated for the MDP area (Options A, B, and C). Option A is a modification of existing bridges. This option does not require the construction of new bridge structures; rather it would utilize the existing bridge structures and improve their ability to carry more traffic by adding lanes within the current horizontal confines and increase vertical clearances by excavating the roadbeds below the bridges.

Under Option B, a new roadway would be constructed over the railroad line. This option calls for the construction of a "fly-over" bridge to replace the Walbach Street underpass. The Pequot Avenue underpass would be improved as in Option A.

New railroad underpasses would be constructed under Option C to replace existing bridges. This would require that the Amtrak railroad tracks be elevated slightly to increase vertical clearances and shifted slightly to the east to allow for maintenance of rail traffic during construction.

Each of the roadway improvement options has advantages and disadvantages. These "pros and cons," along with a discussion of potential impacts of each access option, are presented in more detail in Table 3.2-1 and are shown graphically in Figures 3.2-7, 3.2-8, and 3.2-9. It is anticipated that roadway improvements will be refined during the MDP process and during final design.

In addition to increasing traffic capacity at the railroad underpasses, there is a need to widen and

realign roads in the vicinity of the railroad in order to increase traffic capacity, improve sight lines, and provide for better and safer roadway geometry. The three options depict these changes as well. The commonalties among the three options as they relate to road improvements are:

1. realign Howard Street to the west and discontinue Harris Street in order to improve sight lines and provide safer roadway geometry;

2. provide full traffic signals at the four intersections that lead to the railroad underpasses (or overpass) (i.e. Howard and Walbach; Walbach and Pequot Avenue Extension; Pequot Avenue and Trumbull; and Shaw Street, Willetts Avenue and Howard Street) and at the intersection of Howard and Hamilton Streets;

3. widen Howard Street between Hamilton and Shaw Street to four lanes minimum;

4. discontinue Nameaug Street and shift traffic patterns onto a proposed extension of Pequot Avenue that will extend north to connect with Walbach Street. This will serve to distribute traffic more efficiently between the two bridges and reduce the potential for traffic delays; it will also allow for safer and more efficient access to the proposed Pfizer site by creating a "four-way" intersection at Pequot and Trumbull and the Pfizer's northerly access road; and

5. widen Pequot Avenue between the southern end of the proposed Pfizer site and Trumbull Street to a minimum of three lanes.

TABLE 3.2-1
Access to Fort Trumbull MDP Area
Comparison of Access Options

		Option A	Option B	Option C
1.	Description	Minimal improvements to existing underpasses.	Construct "fly-over bridge (overpass) to replace Walbach St. underpass; minimal improvements to Pequot Ave. underpass.	Construct two new under-passes/elevate Amtrak RR tracks
2.	Relative Cost	Least expensive of 3 options.	Potentially most expensive of 3 options.	Nearly as expensive as Option B
3.	Projected intersection LOS under Land Use Alternatives 4 & 5 (for year 2010)	LOS "C" or better, except LOS "D" in p.m. hours at Bank Street/ Howard Street intersection (under Land Use Alternate 4).	LOS "C" or better, except LOS "D" in p.m. hours at Bank Street/Howard Street intersection (under Land Use Alternate 4) and LOS "D" in a.m. peak hour at Howard Street/New Bridge Road (under Land Use Alternate 4).	LOS "C" or better, except LOS "D" in p.m. hours at Bank Street/ Howard Street intersection (under Land Use Alternate 4).
4.	Provides for the re-placement of Walbach St. RR underpass	Does not result in the replacement of the Pequot Ave. underpass.	Does not result in the replacement of the Pequot Ave. underpass.	Pequot Ave. bridge to be replaces with new underpass.
5.	Provides for the re-placement of Pequot Ave. RR underpass	Does not result in the replacement of the Pequot Ave. underpass.	Does not result in the replacement of the Pequot Ave. underpass.	Pequot Ave. bridge to be replaces with new underpass.
6.	Alleviate current flood problems	Requires lowering road bed beneath each overpass; flooding problem to be mitigated by construction of storm chambers and high-volume pumps to discharge water at times of storms. This solution will improve current situation but will still not meet flood regulations and will be subject to flooding during extreme coastal storms.	Flooding problem at Walbach Street would be eliminated by virtue of the "flyover" bridge; flooding problem at Pequot Ave. to be mitigated (see note for Option A).	Flooding problem at Walbach St. under-pass to be mitigated by combination of elevating the railroad bed (as feasible) at new track location and lowering roadbed to create clearance of approx. 14'-6". A storm water pumping station may still be required. Flooding problem at Pequot Ave. underpass to be mitigated by combination of elevating the railroad be at new track location and lowering road bed to create clearance of approx. 14'-0".
7.	Provides adequate vertical clearance for trucks/buses (current clearances are 10'-0" at Walbach underpass and 12'-8" at Pequot under-pass)	Requires lowering road bed beneath each overpass; even then, optional vertical clearance of 14'-6" cannot be achieved.	Walbach St. will have unlimited vertical clearance since road will be over tracks; Pequot Ave. underpass will have a clearance of approx. 13'-6" through lowering of roadbed.	Walbach St. underpass will have a clearance of approx. 14'-6" through combination of elevating rail tracks and lowering of roadbed. Pequot Ave. under-pass will have a clearance of approx. 14'-0". through combination of elevating rail tracks and lowering of road bed.

8.	Ability to facilitate evacuation of peninsula in major storms	Peninsula will be nearly as susceptible to flooding as it is currently during extreme coastal storm events although construction of storm pumps will provide a longer period of time for vehicles to exit peninsula . . . evacuation of vehicles may also be prone to disruption by accidents since lane widths of 11 feet at the underpasses is less than desirable by current standards.	Evacuation of the peninsula is best facilitated by this option since the "flyover" bridge will not be subject to flooding and has adequate capacity.	Evacuation routes will still be below flood elevations under this options but since vertical and horizontal clearances at the bridges (underpasses) will be greatly improved and storm water pumps will be constructed, evacuation will be better facilitated than under Option A.
9.	Corporate image/ Attraction of investment dollars	Utilization of existing undersized and old RR underpasses may not present an image consistent with a progressive, world-class development.	Construction of a new "flyover" bridge would create a dramatic entrance to the Fort Trumbull area and offer distant views of the Thames River. Utilization of existing undersized and old RR underpass at Pequot Ave. may not present an image consistent with a progressive, world-class development.	Construction of new underpasses provides the opportunity to create a more impressive corporate/business image with wide and well-aligned traffic lanes, road shoulders, full sidewalks, etc.
10.	Impact to Amtrak rail lines	No impact, to existing Amtrak rail line or operations . . . may require underpinning of existing abutments of underpass(es) while maintaining train use above.	No impact to existing Amtrak rail line or operations . . . may require underpinning of existing abutments of Pequot Ave. underpass while maintaining train use above. Construction of steel girders of new overpass will need to be closely coordinated with Amtrak schedules to ensure safety of trains and passengers.	Significant impact to Amtrak rail line since it will need to be reconstructed for a distance of approximately 2,600 feet to increase its elevation and to relocate both tracks on new bridges approx. 30 feet east of current alignment. Work of changing over to new alignment can be phased and coordinated with Amtrak schedule to avoid disruption of service.
11.	Impact to existing U.G utilities	Impact to sanitary sewer trunk line (may have to be lowered) at Walbach St. underpass; Possible impacts to other utilities at Pequot Ave. underpass.	No impact to utilities at Walbach St. underpass. Possible impacts to utilities at the Pequot Ave. underpass.	Impact to sanitary sewer trunk line (may have to be lowered) at Walbach St. underpass; Possible impacts to other utilities at Pequot Ave. underpass.
12.	Potential for traffic disruption during construction	Minimal disruption at each underpass.	Minimal disruption at Pequot underpass; no disruption at Walbach St. underpass.	Potential for disruption at both underpasses during construction of new bridges . . . traffic will have to be rerouted (possibly alternating between Walbach and Pequot) during construction.

13.	Degree to which option detracts from land developability	Relocation of Howard Avenue approximately 100 feet to west will reduce developability of "Gateway parcels.	Proposed "fly-over" bridge and its approaches with embankments will utilize developable land. Relocation of Howard Avenue approximately 180 feet to west will reduce developability of "Gateway parcels.	Relocation of Howard Avenue approximately 100 feet to west will reduce developability of "Gateway parcels.
14.	Sidewalks under bridges	Walbach St. currently has sidewalks at each side of underpass, one of the walks will be eliminated to provide space for an additional vehicular travel lane under the underpass; Pequot Ave. currently has one sidewalk along the south side of the underpass, this walk will be maintained or reconstructed.	New overpass which will replace the Walbach St. underpass could have walks on each side of road; Walbach St. underpass will be abandoned and could be utilized as a pedestrian/ bikeway corridor between the "Gateway" and the peninsula; Pequot Ave. currently has one sidewalk along the south side of the underpass, this walk will be maintained or reconstructed.	The construction of new, wider underpasses at both Walbach and Pequot will present the opportunity to construct new sidewalks on both sides of the road at each location.
15.	Bike lane under bridges	No bike lanes currently exist at either Walbach or Pequot. The reduction of lane width at both locations will not provide any opportunity for bike lanes or road shoulders. Biking within the travelways under the underpasses at Walbach and Pequot will be hazardous.	New overpass which will replace the Walbach St. underpass could have wide shoulders and/or bike lanes on each side of road, however, the benefit of providing bike lanes will have to be weighed against the added costs to construct a wider bridge. The reduction of lane width at the Pequot Ave. underpass will not provide any opportunity for bike lanes or road shoulders. Biking within the travelway under the underpass at Pequot will be hazardous.	The construction of new, wider underpasses at both Walbach and Pequot will present the opportunity to construct wide road shoulders and/or bike lanes on both sides of the road at each location.
16.	Facilitates access to proposed Pfizer facility	All three options facilitate access to Pfizer by virtue of adding lanes on Howard between Hamilton and Pequot and eliminating turning movements from Pequot Ave. at the RR underpass to the Pfizer site.	All three options facilitate access to Pfizer by virtue of adding lanes on Howard between Hamilton and Pequot and eliminating turning movements from Pequot Ave. at the RR underpass to the Pfizer site.	All three options facilitate access to Pfizer by virtue of adding lanes on Howard between Hamilton and Pequot and eliminating turning movements from Pequot Ave. at the RR underpass to the Pfizer site.

17.	Potential to inconvenience existing through traffic or local traffic patterns or travel times	Requires the closing of Trumbull St. between Pequot Avenue and the WWTP site and the closing of Harris Street. New signals and added turning movements from Pequot northbound to Shaw/Howard Ave. will increase through travel time from current level. Nameaug St. to be closed and traffic pattern shifted to new extension of Pequot Ave.	Possible termination of Shaw St. in a cul-de-sac near its intersection with Howard Ave. and the closing of Harris St. (to avoid traffic conflicts . . . current volumes of traffic from Shaw St. to are minimal compared to traffic on Howard or Willets St.). New signals and added turning movements from Pequot northbound to Shaw/Howard Ave. will increase through travel time from current level existing access road north of Hamilton Ave. that serves the east side of Shaw's Cove will have to be rerouted under the new overpass at Hamilton St., then turn west to intersect directly with Howard Ave. Walbach St. to be closed between Nameaug St and Howard Ave. and traffic patterns shifted to new bridge over Amtrak line at Hamilton Ave. Nameaug St. to be closed and traffic pattern shifted to new extension of Pequot Ave.	Requires the closing of Trumbull St. between Pequot Avenue and the WWTP site and the closing of Harris St. New signals and added turning movements from Pequot northbound to Shaw/Howard Ave. will increase through travel time from current level. Nameaug St. to be closed and traffic pattern shifted to new extension of Pequot Ave.
18.	Regulatory Issues	Inadequate vertical clearances and flooding issues at both underpasses.	Inadequate vertical clearance at Pequot Ave. underpass; Flooding issues at Pequot Ave. underpass	Possible inadequate vertical clearances and flooding issues at both underpasses.
19.	Potential visual impact	No visual impacts associated with access (other than increased pavement areas and the introduction of traffic signals) are anticipated.	The "flyover" bridge will rise to approx. elevation 46 feet including bridge parapets. This has the potential to block views of the Thames River from surrounding MDP sites and nearby residential properties.	Minimal visual impacts associated with the construction of new underpasses and relocated rail tracks (e.g. railroad embankment will be extended)

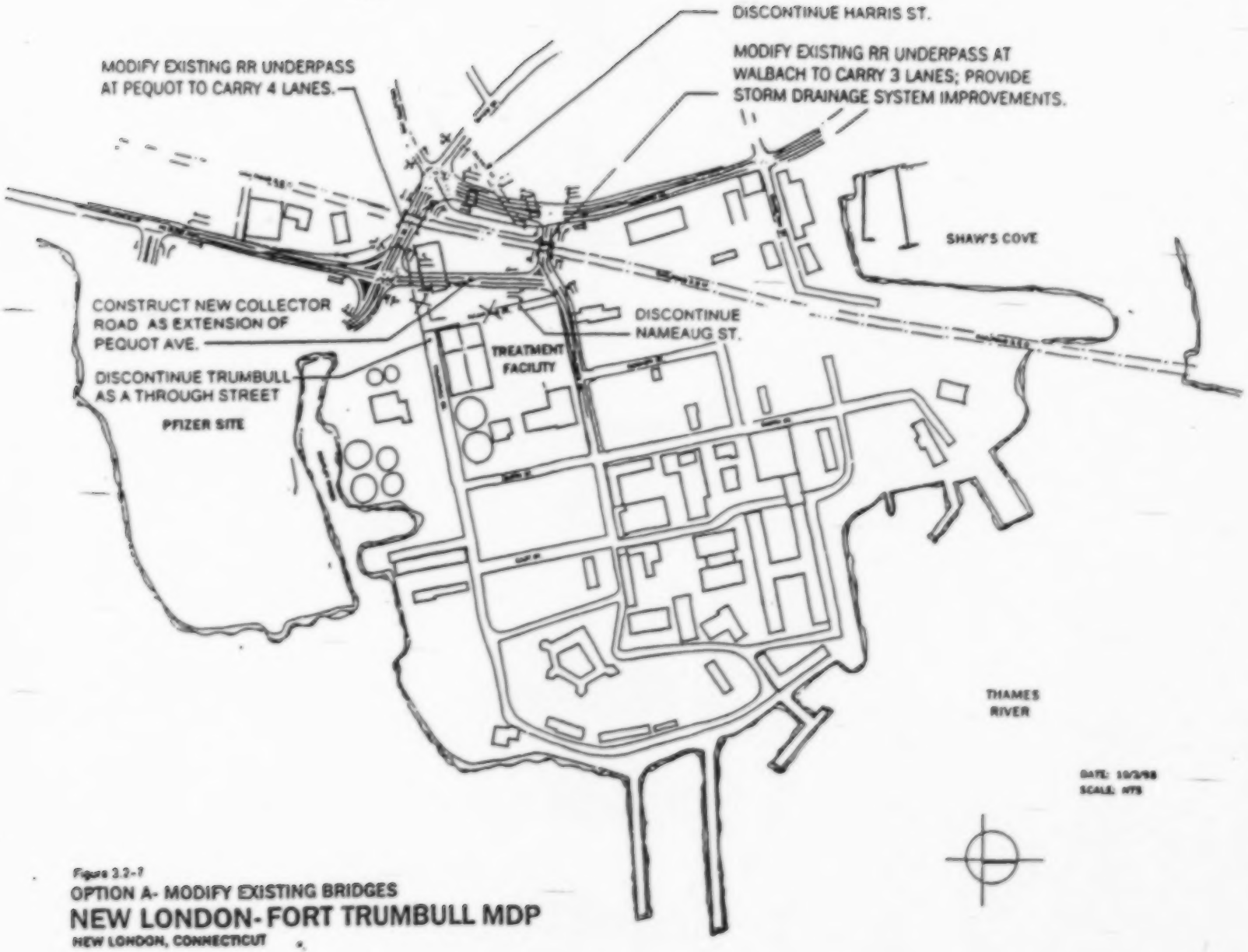


Figure 3.2-7
OPTION A- MODIFY EXISTING BRIDGES
NEW LONDON- FORT TRUMBULL MDP
NEW LONDON, CONNECTICUT

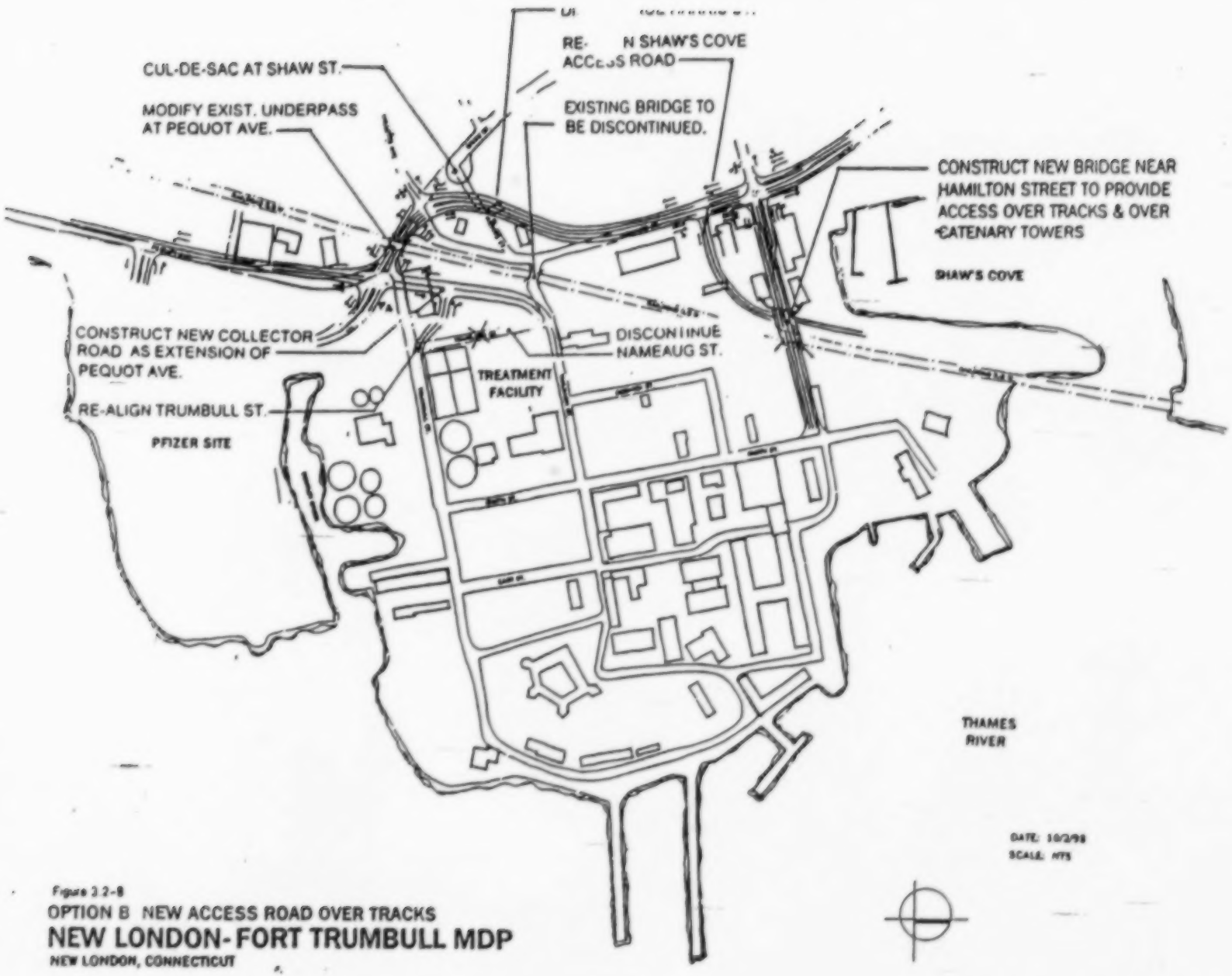


Figure 3.2-8
OPTION B NEW ACCESS ROAD OVER TRACKS
NEW LONDON- FORT TRUMBULL MDP
NEW LONDON, CONNECTICUT

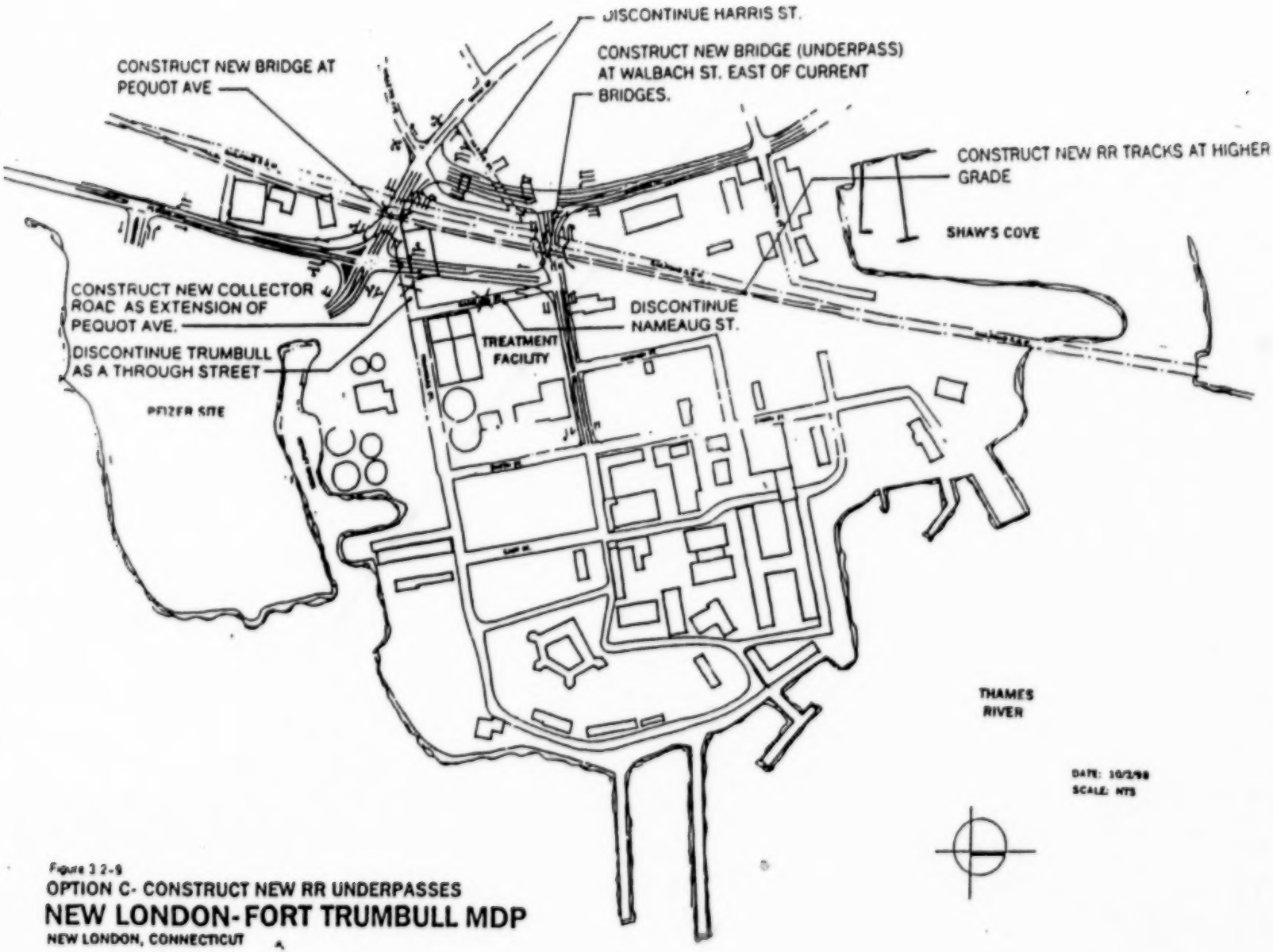


Figure 3.2-9
OPTION C- CONSTRUCT NEW RR UNDERPASSES
NEW LONDON- FORT TRUMBULL MDP
NEW LONDON, CONNECTICUT

In addition to roadway improvements, future traffic improvements should be made as follows:

- providing a westbound double left turn lane and a northbound double right turn lane at the intersection of Bank Street/Howard Street/Reed Street;
- upgrading traffic signal installation with new timing, phasing, and sequencing at the Bank Street/Howard Street/Reed Street intersection;
- revising timing of the existing traffic signal at Bank Street/Shaw Street/Trumbull Street; and
- installing new traffic signals (from STOP sign control) at the following intersections:
  - Howard Street at Hamilton Street;
  - Howard Street at Relocated Hamilton Street (Roadway Improvement Option B only);
  - Howard Street at Walbach Street;
  - Howard Street at Shaw Street/Willetts Avenue/Pequot Avenue; and
  - Pequot Avenue at Trumbull Street/Pfizer Drive.

In addition, on-street parking on Howard Street between Shaw Street and Hamilton Street is proposed to be prohibited to maintain four lanes of traffic.

3.2.4 Alternative No. 1 – No Action

The No Action alternative is shown graphically in Figure 3.2-1. This alternative assumes that the MDP process does not proceed. Under this scenario, it is likely that the Navy would proceed with disposition of the NUWC property as planned prior to the introduction of the MDP process. Sixteen acres of this site

would accordingly become state park, to be operated and maintained by the Department of Environmental Protection. The remaining land area would likely be disposed of or publicly sold for future development.

It is noted that use of 16 acres of NUWC land for a state park would reduce the amount of land identified in the LRA's reuse plan for future development, including an area which was identified for a hotel/ conference center. The hotel facility was estimated at 82,500 square feet, with associated parking (264 to 417 parking spaces). The LRA also identified the Columbia Cove area to be used for ferry service. Given the recent commitment to providing ferry service in downtown New London as part of the multi-modal transportation terminal. it is unlikely that ferry service would be provided from the Columbia Cove site as described in the reuse plan.

The following components of the No Action alternative reflect the LRA's preferred plan as amended for the expanded state park. These uses are confined to the NUWC portion of the MDP area. The remainder of the project area would remain in the context of the existing land use patterns, with possible redevelopment of the area taking place on a parcel-by-parcel basis.

It should be noted that the features and recommendations of the preferred LRA plan may not evolve in the public sale portion of the NUWC property. Individual future owners would either inhabit individual buildings "as is," conduct renovations (ranging from relatively minor to major), or demolish the existing buildings and construct new ones. The LRA preferred plan features are assumed for the purposes of this analysis.

State Park – The proposed 16-acre Fort Trumbull State Park is described above as common to all alternatives. Detailed programming and planning for the park are currently underway by the Connecticut Department of Environmental Protection. The LRA plan anticipated restoration and reuse of Buildings 13, 14, 27, 32, and 42 for office and as attractions. The plan also identified the use of Piers 4 and 7 for recreational uses (fishing, boat mooring) and possibly R&D support in the case of Pier 7. The plan projected parking potential of 10 to 115 parking spaces.

Research & Development/Incubator – The central portion of the NUWC property is identified for reuse as research & development. incubator space, and incubator training space. The plan contemplates the reuse of five NUWC buildings (Buildings 2, 80, 96, 99, and 101) for a total of 377,900 square feet. The reuse plan also identified parking for 980 to 1,060 vehicles.

Water-Related Use – The third major use area is the land located at the north end of the NUWC property and identified for a public benefit conveyance area for water-related uses. Such uses could include ferry terminal, boat launch, or marina. Support facilities would be accommodated on-site to include terminal and storage buildings (6,600 square feet), landings, parking (160 to 204 parking spaces), and a small clubhouse (3,000 square feet).

Open Space – In addition to the state park, the reuse plan identified an area of open space along the north shore of Columbia Cove located between the R&D/ Incubator area and the Water-Related Use area. Specific uses are not identified.

3.2.5 *Alternative No. 2 – Recreation/Tourism*

The Recreation/Tourism alternative is shown graphically in Figure 3.2-2. This alternative capitalizes on the state's commitment to the Fort Trumbull State Park by focusing the majority of uses east of the Amtrak line as recreational or tourism related. It also maximizes public access to the waterfront as one of the project goals. The cultural, museum, and recreational uses would supplement the museum space that is anticipated to be provided within the state park. With this additional use, visitors would have the opportunity to experience several museums in the immediate vicinity with a day trip to the Fort Trumbull area. The proposed recreation center is compatible with the adjacent uses, including the railroad, open space, parking, and hotel.

The following specific land use concepts are proposed under this alternative:

State Park – The state park is shown in this alternative as expanded from 16 acres to 30+ acres. In planning studies which took place prior to the initiation of the CEPA process, the state expressed an interest in an expanded park beyond that which was initially identified in the early land use plan alternatives. In this alternative, the park has been enlarged to include all of the NUWC land and an adjacent block bound by East, Walbach, and Smith Streets. This alternative (as well as Alternatives 3 through 6) assumes 100 paved parking spaces plus an additional 200 grass parking spaces for overflow parking (personal communication 10/2/98, Pamela Adams, DEP). It is assumed that none of the buildings in the expanded section would be reused. DEP representatives have indicated that funding is not currently in place for additional demolition and remediation that that would be required for an expanded state park.

Cultural/Museum/Recreation – The area to the west and north of Walbach Street is approximately eight acres in size and has been identified for cultural/museum/active recreation uses. Museum space is estimated at 50,000 to 70,000 square feet, to be accommodated in one or more buildings. Parking would be provided by 200 to 240 parking spaces. Some outdoor recreation space associated with the recreation center immediately to the north is shown within this land use area. The recreation fields are placed next to the rail line, since these uses are considered to be compatible.

Recreation Center – The recreation center is shown on an area of approximately 1.5 acres and would accommodate a building of 25,000 square feet. It would provide indoor recreation and exercise facilities adjacent to the playfields and the hotel to the north. It is assumed that the state park could not provide these types of facilities that are customarily provided by municipalities or private interests.

Hotel – At approximately 3.2 acres, the hotel use area is located on the waterfront, oriented to views of the Thames River, downtown, and a proposed waterfront commercial or marina use. The public riverwalk would pass through the parcel along the waterfront. The hotel area has the capacity to accommodate an 80-room facility, with associated parking of 120 spaces. This site was selected to be more distant from the flooding and wave action hazard zone found further east. The use area also provides a higher base ground elevation. The hotel site would be designed so as to ensure that development proceeds in a manner that is consistent with the CCMA.

Office/incubator – Most of the Gateway Area west of the rail line is shown as office or office/incubator use. Besides the office/incubator uses common to all action

alternatives, the area west of Howard Street is approximately 4.3 acres (2.9 acres usable due to environmental constraints) and can accommodate 50,000 square feet of office/incubator space and 150 parking spaces. Its location capitalizes on similar uses across Howard Street which include an existing office building and proposed office/incubator noted above as common to all alternatives. These uses are located to be close to and along the travel route to the Pfizer facility, thereby capitalizing on a synergy between them. This location isolates these uses from the state park and the other recreational and tourism uses that are consolidated east of the railroad in this alternative.

Retail – The retail area is shown at the corner of Howard Street and Harris Street on approximately three acres. The area can provide approximately 20,000 square feet of retail space and is expected to be convenience shopping and specialty shops for the neighborhood residents and employees from Pfizer and other businesses in the redevelopment area. Parking is anticipated at 80 parking spaces due to high turnover associated with convenience shopping. Given the number of existing residents and employees, combined with an anticipated increase, there will be a growing need for this type of retail use.

3.2.6 Alternative No. 3 – Residential/Commercial

A strong sentiment was voiced at numerous monthly neighborhood meetings (beginning in April 1998) to pursue at least one alternative which embraced a residential component. Accordingly, these uses were evaluated in several alternatives. Alternative 3 maximizes this type of use and incorporates both new development and rehabilitation of existing residential uses.

The Residential/Commercial alternative is shown graphically in Figure 3.2-3. This alternative is focused on providing housing to meet the needs of the existing community and future residents. The use areas would permit a variety of housing types and capitalizes on the amenities of the state park, the Thames River, water-related facilities, and proximity to downtown New London. The following specific land use concepts are proposed under this alternative:

State Park – Fort Trumbull State Park is maintained at 16 acres within the NUWC property as noted for all alternatives (except Alternative 2).

Mid-Density Residential – The area west and immediately adjacent to the state park is approximately 16 acres and could provide for 115 dwellings of varying sizes. The density (7 du/acre) is similar to the existing neighborhood, allowing for single-family detached and single-family attached units such as duplexes. Parking would be available for a minimum of 270 vehicles. This residential pattern would allow portions of the existing neighborhood to be retained and supplemented or redeveloped with new homes at similar density to current conditions. A major amenity of this area for housing is its proximity to the proposed state park and the waterfront.

A second area of mid-density residential is shown in the MDP Gateway Area west of Howard Street. It would be built or redeveloped as an extension of the existing neighborhood to the west and south. The parcel is known to have some environmental constraints, but with clustered development is expected to yield approximately 20 dwellings, including attached and detached dwelling units.

High-Density Residential – The area along the northern edge of the peninsula is identified for a

high-density residential use. It is approximately 6.5 acres in size and could accommodate 160 dwelling units in a high-density development (25 du/acre). Dwelling units would be a mixture of apartments and/or townhouse units. This use area is located to take advantage of the high amenity elements, including views of downtown and the river, as well as the proximity to the proposed waterfront commercial/marina in Columbia Cove, the new state park, and the public riverwalk. Parking would be provided and would include additional parking spaces to be used by marina users who are not residents, and for other waterfront commercial uses in the Columbia Cove area.

Open Space – The area along Goshen Street abutting the railroad line is to be used for open space under this alternative to meet community recreation needs and to serve as a buffer to the railroad. It is approximately 3.5 acres and would provide opportunity for both passive and active recreation for the nearby community. The use area would include some multipurpose fields and recreation facilities.

Office/Incubator – Within the gateway portion of the MDP area, the parcels east of Howard Street are identified for office/incubator use. This would be the existing office building and new space at the intersection of Howard Street and Hamilton Street identified as common to Alternatives 2 through 6.

Retail – A retail area is proposed at the corner of Howard and Harris Streets on approximately three acres. The area can provide approximately 20,000 square feet of retail space and is expected to develop as convenience shopping and specialty shops for the neighborhood residents and employees from Pfizer and other businesses in the redevelopment area. The use would provide 80 parking spaces to serve customers at a high rate of turnover due to the type of retail.

Given the number of existing residents and employees, coupled with an anticipated increase, there will be a greater need for this type of use.

3.2.7 Alternative No. 4 – Business Campus

The Business Campus alternative focuses on the economic potential of the area by maximizing office/incubator uses and job creation. This alternative is shown graphically in Figure 3.2-4. The focus of this alternative is to provide the maximum amount of office/incubator space in close proximity to the adjacent Pfizer development. The largest amount of land area within the MDP area is located east of the railroad line. A portion of this land was previously used by the Navy as office and research. Numerous large and small buildings remain with the potential for reuse of some of them. The following specific land use concepts are proposed under this alternative:

Office/Incubator – The majority of the Fort Trumbull area adjacent to the proposed state park, the regional wastewater treatment facility, and the railroad is depicted as office/incubator space in this alternative. It includes approximately 20 acres and could support 350,000 to 375,000 square feet of space, including necessary parking, plus some additional parking and shared parking for the adjacent waterfront development. The major attributes to this location are proximity to the Pfizer site and existing office/research facilities on a large portion of this land use area. The other area shown for office/incubator on this alternative would be along Howard Street and Hamilton Street as depicted for Alternatives 2 through 6.

Hotel/Conference – The land use area that is shown for hotel/conference center is located along the northern edge of the peninsula. It includes approximately

7.5 acres and is oriented to take advantage of the views of the river, downtown, and the waterfront development at Columbia Cove. The site is a short distance from downtown and the Pfizer site. This use area would accommodate a 200-room hotel with support space (20,000 square feet) for meeting and dining, plus parking (400 to 550 spaces). The structure would be elevated due to the flooding risk and would allow for parking beneath a portion of the facility. Some of the parking would be shared by the adjacent waterfront commercial uses. An elevated structure would provide an opportunity for excellent long views. The site would be served by the public riverwalk leading through the state park to the south and to downtown to the north.

Mid-Density Residential – This use area is shown west of Howard Street at its intersection with Harris Street. It includes an area of approximately four acres (3.1 usable acres) and would provide for approximately 22 dwelling units, including attached and detached units. The adjacent parcel at Harris Street and Shaw Street would remain in residential use. The eight homes present today may remain or be redeveloped. Residential use in these areas would continue the adjacent residential pattern and provide additional housing to meet part of the future demand.

Retail – The retail area in this alternative is shown at the corner of Howard Street and Hamilton Street. It is approximately 1.8 acres and could provide for approximately 15,000 square feet of convenience shopping and parking (60 parking spaces) for residents and employees of the area.

3.2.8 Alternative No. 5 – Mixed Use 1

This Mixed Use alternative is shown graphically in Figure 3.2-5. This alternative is a hybrid of several of the alternatives discussed above and attempts to pull in attractive features from each. The following specific land use concepts are proposed under this alternative:

Mid-Density Residential – This use area is approximately 17 acres and is located nearly in the center of the Fort Trumbull MDP area adjacent to the state park, regional wastewater treatment facility, and Columbia Cove. It could provide approximately 115 dwellings of varying size and type and parking for a minimum of 230 vehicles. This development could be accomplished by either retaining a portion of the existing neighborhood, with rehabilitation and infill development, or by completely redeveloping the existing neighborhood and the adjacent area. The density would be similar to existing density, on average, with higher density closer to the amenities such as the water's edge, state park, and new marina or other waterfront use.

Athletic Club – An area of approximately 3.5 acres is identified for an athletic club with indoor and outdoor facilities. The indoor use would be 25,000 square feet to include court space and multi-purpose rooms for fitness and training. Outdoor space would include some play areas and courts. Parking would be available for 85 cars. It would be located just north of the Howard Street/Walbach Street intersection to be convenient for users from the community. Pfizer employees, and the hotel/conference center. It would also provide a suitable use as a buffer along the rail line.

Hotel/Conference – The land use area that is shown for hotel/conference center is located along

the northern edge of the peninsula. It includes approximately 7.5 acres and is oriented to take advantage of the views of the river, downtown, the athletic club, and the new waterfront commercial/marina area. The site is a short distance from downtown and the Pfizer site. It would accommodate a 200-room hotel with support space (20,000 square feet) for meeting and dining, plus parking (400 to 550 parking spaces). Additional parking would he provided for the marina and other waterfront commercial development in that use area. The structure would be elevated due to the flooding risk and would allow for parking below a portion of the facility. An elevated structure would provide an opportunity for excellent long views. The site would be served by the public riverwalk leading to the state park and downtown.

Office/Incubator – All of the Gateway Area west of the rail tine (except adjacent to Shaw's Cove) is shown as office or office/incubator use. In addition to the uses common to all alternatives, the area west of Howard Street is approximately five acres in size and can accommodate 70,000 square feet of office/incubator. Its location capitalizes on the similar use across Howard Street. The total amount of office/incubator use is approximately 150,500 square feet and is located to be close to and along the travel route to the new Pfizer facility, thereby capitalizing on a synergy between them. This location isolates these uses from the state park and the other uses (residential, hotel, state park) located east of the rail line.

Retail – The retail (10,000 square feet) would be incorporated into the office/incubator use area and is expected to be convenience shopping and specialty shops for the neighborhood residents as well as employees from Pfizer and other businesses in the area. The use area would provide 40 parking spaces for shoppers. Given the number of existing residents and

employees coupled with anticipated increases, there will be a growing need for this type of retail use.

3.2.9 Alternative No. 6 – Mixed Use 2

This Mixed Use alternative is similar to Alternative 5, with several modifications to improve recognized deficiencies in that alternative, most notably the concentration of residential uses in the floodplain. This alternative is shown graphically in Figure 3.2-6. The following specific land use concepts are proposed under this alternative:

Mid-Density Residential – The mid-density residential use described in Alternative 5 would be reconfigured as a clustered mid-density residential use in Alternative 6. This use area is approximately 11 acres and is located in the higher ground of the Fort Area. It could provide approximately 115 dwellings at 10.5 dwelling units per acre and parking for a minimum of 230 vehicles. Parking would be accommodated in the rear of the dwelling units, closer to the railroad line. Suitable buffering would be necessary in addition to the parking area to shield residential uses from the rail operations. Under this alternative, complete redevelopment of the existing neighborhood and the adjacent area would occur, with no retention of the existing residential dwellings. The principal reason for the shift in configuration of the residential use from Alternative 5 to Alternative 6 is to pull the intensity of development out of the flood prone area adjacent to the Thames River and to open up views and access to the waterfront.

Athletic Club/Open Space – An area of approximately 12 acres is identified for a combination of open space and athletic club with indoor and outdoor facilities. This locates a relatively low intensity use in the

floodplain. The indoor use would be 25,000 square feet to include court space and multi-purpose rooms for fitness and training. Outdoor space would include some play areas and courts. It would be located just east of the residential use and south of the hotel/conference center. Parking would be available for 85 cars.

Hotel/Conference – The land use area that is shown for hotel/conference center is located along the northern edge of the peninsula as in Alternative 5 but it is expanded to the south to encompass approximately nine acres. As in Alternative 5, the hotel/conference center is oriented to take advantage of the views of the river, downtown, and the new waterfront commercial/marina area It would accommodate a 250-room hotel with support space for meeting and dining, plus parking. As in Alternative 5, additional parking would be provided for the marina and other waterfront commercial development in that use area. The structure would either be elevated to allow for parking below a portion of the facility or it would be situated on the higher elevations of the site, out of the floodplain. An elevated structure would provide an opportunity for excellent long views. The site would be served by the public riverwalk leading to the state park and downtown.

Office/Incubator – The office/incubator use in Alternative 6 would be identical to that described for Alternative 5.

Retail – The retail use in Alternative 6 would also be identical to that described for Alternative 5.